EXCLUSIVE REPORT INSIDE THE WORKSHOP WITH THE AIRCRAFT RESTORATION COMPANY

AEROPLANE

August 2025
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HISTORY IN THE AIR SINCE 1911

MARS

Captaining the last of the giant US flying boats

PHILIPPINE MARS

TIGER FORCE
The RAF bombers that would have hit Japan

BAT OUT OF HELL?
McDonnell's outlandish first fighter design

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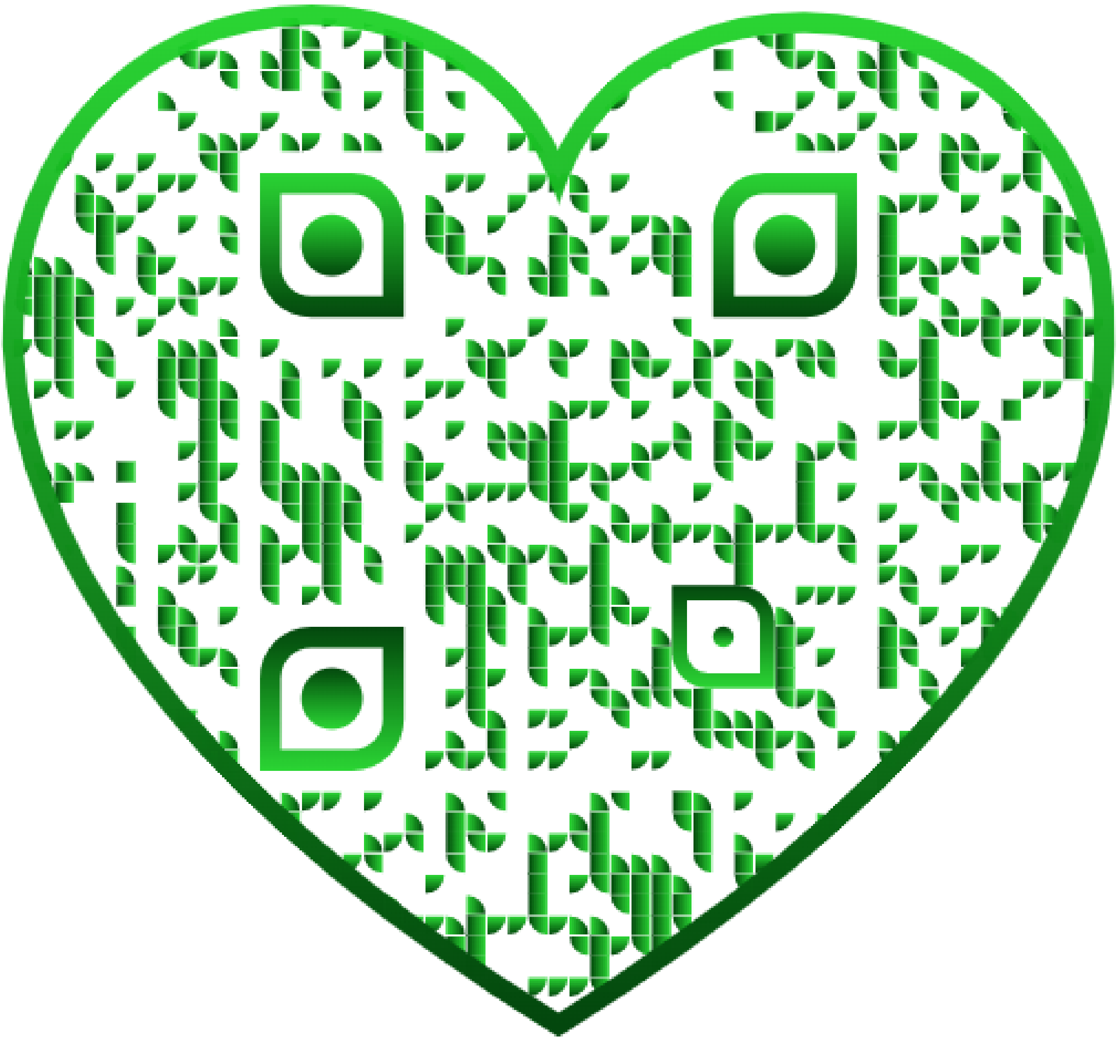

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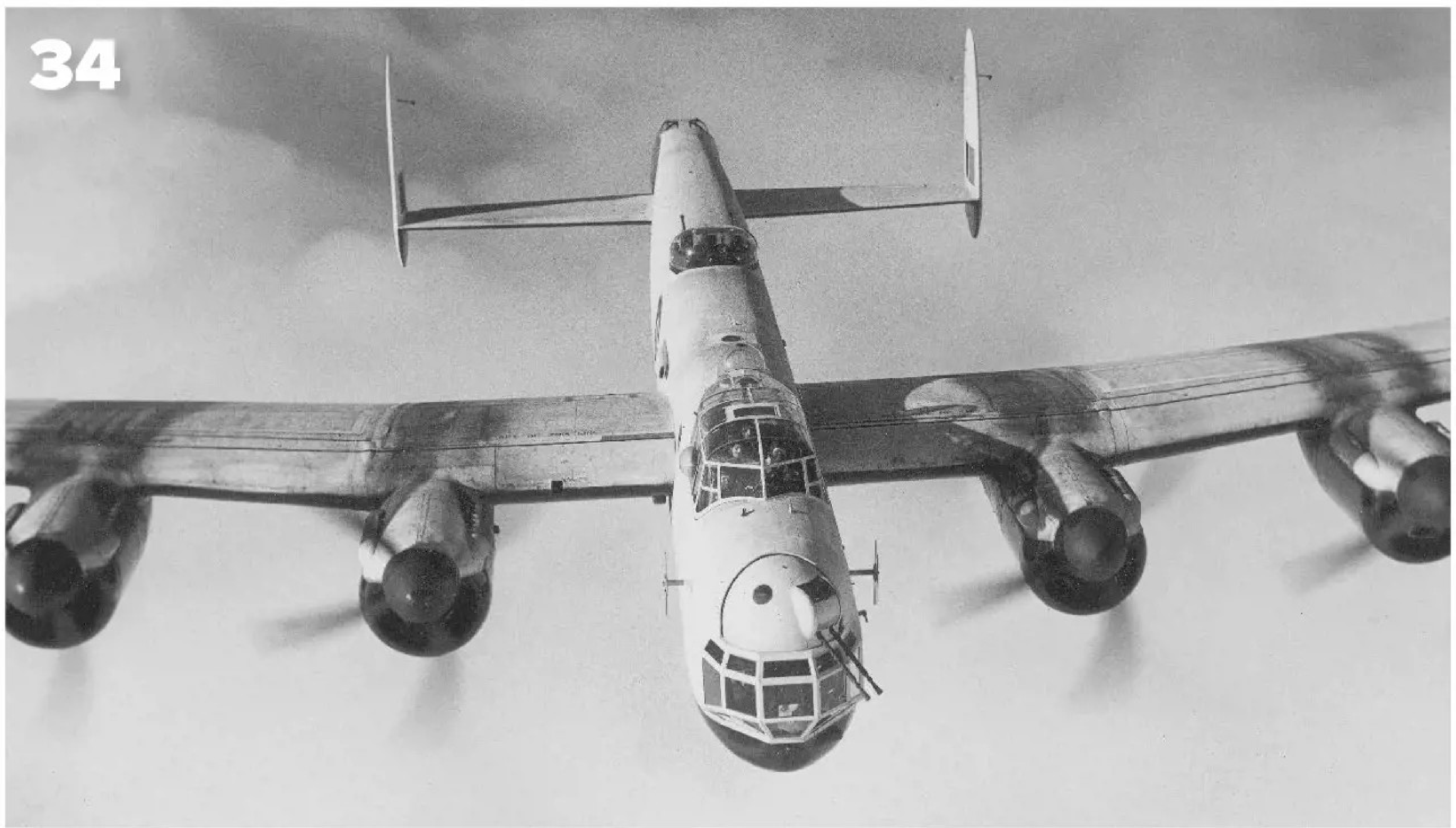

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DATA
BRITTEN-NORMAN TRISLANDER

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COVER IMAGE: Martin JRM-3 Mars *Philippine Mars* during one of its final operations from its long-time home at Sproat Lake. DEREK HEYES

From the Editor

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Even as the editor of an historic aviation magazine, I hate to go down the "do you remember when?" rose-tinted nostalgia road so beloved in some quarters these days, but forgive the lapse into a reverie. Looking back 30 years — goodness — to the 50th anniversary of Victory in Europe, I was at Duxford to see the warbird participants in the VE-Day flypast launching on their way to Buckingham Palace. Not just the Battle of Britain Memorial Flight's machines either, but those from the historic flights of the Army Air Corps and Royal Navy too, plus one of Boscombe Down's remaining Harvards (the other was present as a spare) and even an array of civilian warbirds. How long had it been since the likes of a Catalina and P-38 Lightning had overflown London?

> ***"I wonder whether we've seen the last truly great salutes to wartime anniversaries"***

As you'll read next month in an interview with Gp Capt Dave Roome, who masterminded these spectacles, the VE-Day occasion followed on from the previous year's D-Day 50th, in which the international military flypast over Southsea was augmented by an extensive historic element. Later, the London warbird overflight was revived for the VE and VJ-Day 60th, on an even larger scale. Five Dragon Rapides in vic above the capital, or such as the late Bernard Chabbert's Lockheed 12 — truly, it was a one-off. Those were the days of bigger budgets for events of that sort, and, while safety was always paramount, less of a concern about risk and liability. But I digress.

Casting my mind to 1994-95, the official flypasts were but one aspect of the way in which the D-Day and VE-Day anniversaries were marked at air events around the country. Yes, the 50th anniversary was a more important milestone than is the 80th, but there is, I feel, a notable contrast between then and now in the extent of commemorative activity. Take 1995 as an example. The majority of air displays, or at least air display venues, that year saluted Victory in Europe in some form. This year, only a Duxford flying day has, thus far, done so explicitly. There will be a VE tribute at Old Buckenham in late July, while September's Victory Festival at Lee-on-Solent takes both VE and VJ-Days as a theme. Otherwise, though, the subject is seldom to be seen. As the numbers of those — and not just veterans — who recall 1945 dwindle, it seems a shame. By the next significant 10-year anniversary, how many will be left?

There are many reasons behind this. Today there are simply fewer air displays than there were three decades back, and their budgets are stretched more thinly. But is it also indicative simply of the natural shift in generations, and hence priorities? Some museums, for instance, report greater interest in post-war exhibits than in their Second World War counterparts. What a shame there aren't more front-line aeroplanes from that era in flying condition. Given that, the tremendous range of airworthy 1939-45 warbirds at organisers' disposal will always hold sway. But while there will doubtless be excellent events to come, I wonder whether we've now seen the last truly great salutes to the major wartime anniversaries.

Ben Dunnell

AEROPLANE
ESTABLISHED 1911

Aeroplane traces its lineage back to the weekly *The Aeroplane*, founded by C. G. Grey in 1911 and published until 1968. It was relaunched as a monthly in 1973 by Richard T. Riding, editor for 25 years until 1998.

CONTRIBUTORS THIS MONTH

SEAN FEAST

Sean has been a journalist in the military and defence sector for 40 years and is the author of more than 20 books on Bomber Command and the Pathfinder Force. How a dedicated RAF long-range heavy bomber force may have been deployed in the Far East and fared against the Japanese is the subject of Sean's exploration of Tiger Force, whose contribution — some senior officers argued — would have been disproportionate to the effort of getting them there.

JOE MAXWELL

When not volunteering with his local mountain rescue team, Joe is a keen aviation enthusiast, scale modeller and occasional author. He produced a range of decal sheets featuring Irish military and civil subjects which subsequently led to the publication of books on the Irish Air Corps and the Fouga Magister. Fascinated by the precision flying of the Silver Swallows team, Joe says, "It was an honour to interview many of the pilots and technicians who made these fantastic aerobatic displays possible."

DAVID RANSTED

David has worked in the aviation industry for most of his career in a variety of commercial roles. While he has an avid interest in all things aeronautical, his passion is for the history and heritage of airlines, airliners and airports. He has written many articles for Key Publishing titles *Airliner World*, *Aviation News* and *Airports of the World*, and started contributing to *Aeroplane* last year.

JAN TEGLER

A writer and broadcaster from Severna Park, Maryland, but also a long-time pilot, avid amateur racing driver and musician, Jan's words appear in publications internationally on a variety of subjects, from aviation and defence to motor racing, business and the Swiss watch world. He is the author of the book *B-47 Stratojet: Boeing's Brilliant Bomber* from publisher McGraw-Hill. Tegler hosts *Jazz Straight Ahead*, a weekly syndicated jazz radio programme featuring the best in classic straight-ahead jazz from the 1920s right up to today.

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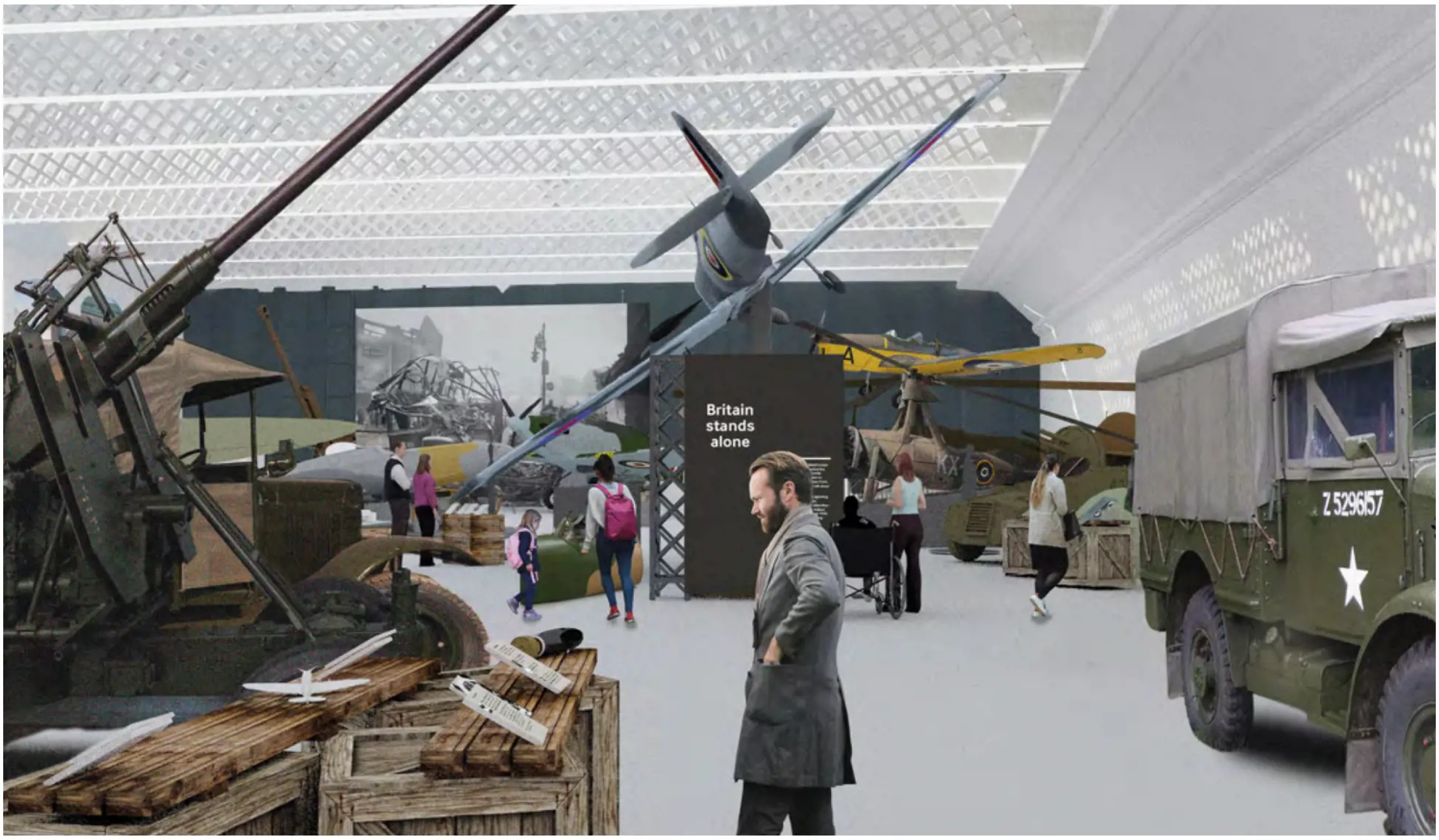
Lottery dosh for Duxford redevelopments



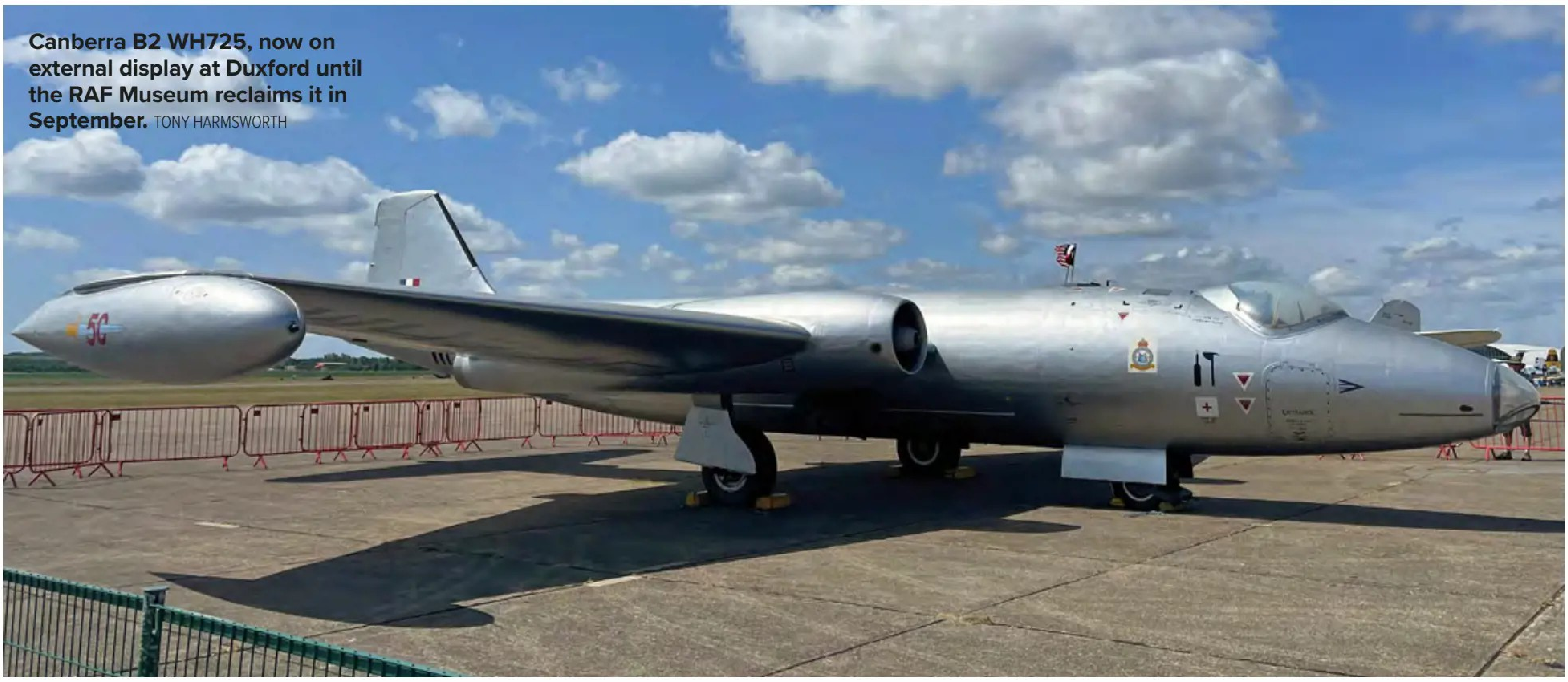
A digital rendering of what to expect in one of the Second World War hangars in the reconfigured IWM Duxford from 2027 onwards. IWM

On 12 June the Imperial War Museums announced the allocation of £222,456 in development finance from the National Lottery Heritage Fund towards new Second World War exhibitions at IWM Duxford. This initial support will help the IWM progress plans to apply for a full National Lottery grant of £4.5 million for the new displays, the centrepiece of a 10-year, multi-million-pound plan which has been dubbed 'Transforming IWM Duxford'.

The IWM says, "Opening in 2027, these major exhibitions will help tell a more coherent story of the Second World War, with many collection items going on display for the first time. Housed in two historic hangars, currently the Air and Sea and Battle of Britain exhibitions, these new exhibitions will display almost 150 objects, integrating aircraft, vehicles and other collection items, including almost forty objects from the Land Warfare Hall."

The Land Warfare Hall was permanently closed to the public on 1 June. The closure has also resulted — after 50 years as an important part of the Duxford scene — in the disbandment of the Duxford Aviation Society (DAS) Military Vehicle Wing, which maintained a fleet of running vehicles on the site at the western end of the airfield. Public rides on some of these vehicles helped raise money for the maintenance of the DAS-owned British Airliner Collection aircraft, three of which have recently been evicted from the AirSpace building at the airfield's eastern extremity: record-breaking DH106 Comet 4 G-APDB, Avro York G-ANTK — a Berlin Airlift veteran, and one of only two survivors of the type — and DH Dove 6 G-ALFU were all removed and now face a future exposed to the elements and the resultant significant increase in maintenance costs.

Another former AirSpace resident recently taken out of covered accommodation, or



Canberra B2 WH725, now on external display at Duxford until the RAF Museum reclaims it in September. TONY HARMSWORTH

what might be dubbed *serious* preservation, is English Electric Canberra B2 WH725 — the only Canberra B2 on show in the UK — which is now on display on the apron at the easternmost end of the Duxford flightline, adjacent to AirSpace. In September it will be reclaimed by the RAF Museum. With both the RAFM sites, at Cosford and Hendon, having Canberras on display, what the future for this important Canberra holds is currently uncertain.

What is certain is Canberras, with their leaky 'goldfish bowl' cockpit canopies, were known during their service lives to suffer serious water ingress, and being out in all weathers also won't be doing the forward portion of the tail fin — which is made from wood — much good.

The AirSpace building — which was opened in July 2007, its £25 million cost being met by the National Lottery, aerospace industry and public support — contained the world's most complete and secure collection of British and Commonwealth-designed and built aircraft. It is now to be reconfigured as a Cold War and 'contemporary conflict' exhibition, but with no room for a type as emblematic of the Cold War period as the Canberra B2 or a Berlin Airlift Avro York, and the dispersal of many military vehicles to other collections around the country, it remains to be seen whether this costly new enterprise will measure up to the excellent National Cold War Museum at Cosford, which also opened during 2007.

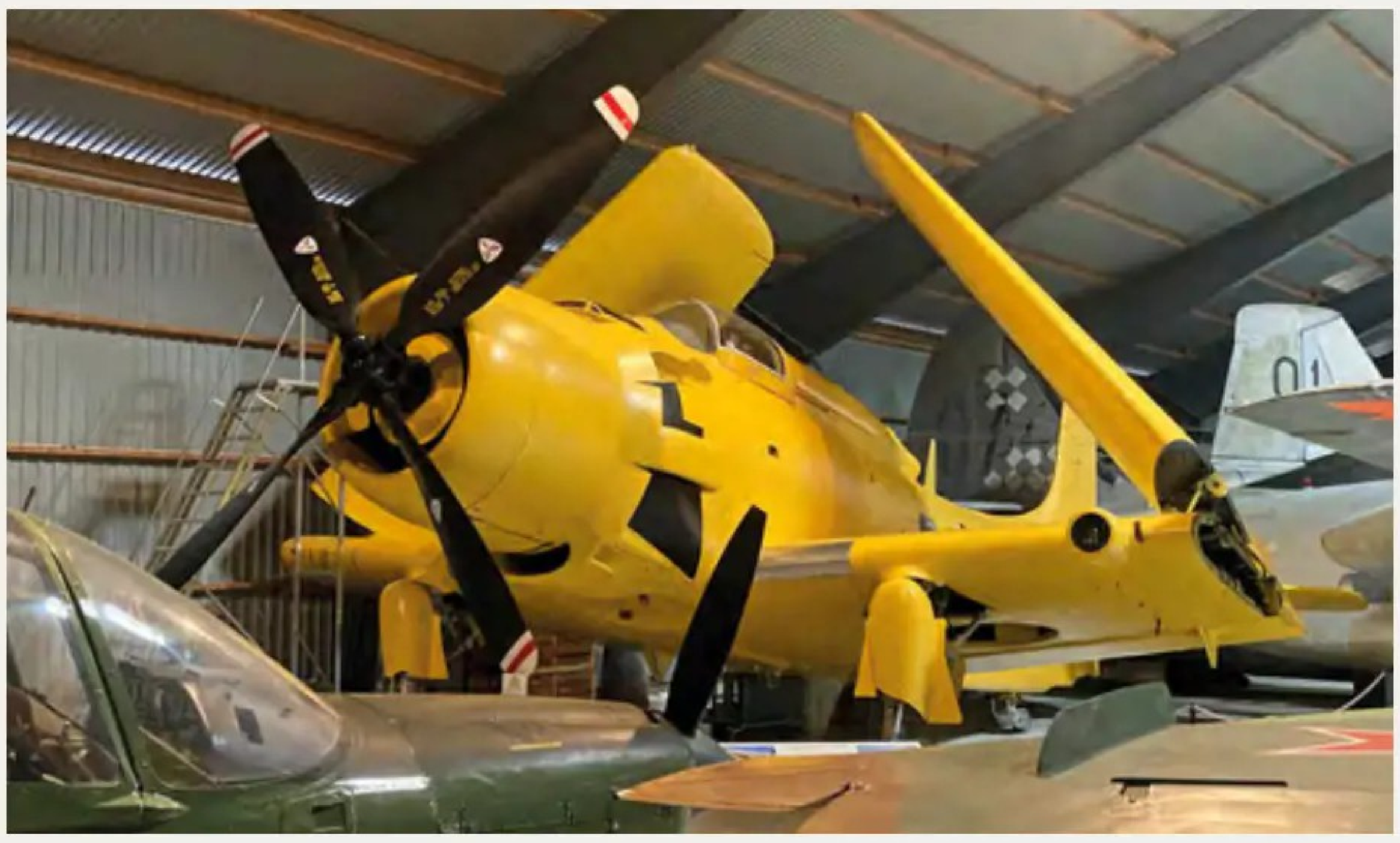
Swedish Skyraider target-tug restored

At the Svedinos Bil- och Flygmuseum car and aviation museum at Ugglarp in southern Sweden, Douglas AD-4W Skyraider SE-EBC has emerged in the striking yellow colour scheme of the Avia AB target-towing company following a decade-long restoration. Some minor additional work, including fitting pylons for the external fuel tanks, is yet to be completed.

Originally built at the Douglas plant at El Segundo, southern California as BuNo 127960, it never entered service with the US Navy, becoming one of 50 transferred to the Fleet Air Arm through the Mutual Defense Assistance Program. In FAA service, the radar-equipped aircraft were designated as Skyraider AEW1s, and operated in the airborne early warning role. Allotted serial WT962, the Skyraider was taken on charge on 15 September 1951, serving with 849 Naval Air Squadron until 1960.

Thirteen of the Royal Navy Skyraiders were sold to Sweden in 1962, being modified as target tugs by Scottish Aviation at Prestwick, with the B-Class registration G-31-6 being given to SE-EBC. Although they were formally owned by the Swedish Crown, most of the Skyraiders were operated by Svensk Flygtjänst (Swedish Air Services), towing targets on behalf of the Swedish Army and Navy. SE-EBC was operated by Avia AB and based at Visby on the island of Gotland. After being withdrawn from use on 2 May 1974, SE-EBC was acquired by Lennart Svedfelt for his Svedinos Bil- och Flygmuseum.

Jan Forsgren



Following a 10-year restoration, AD-4W Skyraider SE-EBC is one of the most striking exhibits at the Svedinos Bil- och Flygmuseum. BJÖRN SVEDFELT

Pardubice debut for Czech Anson

Richard Santus, the founder of RAF Station Czechoslovakia, brings Anson I MH120/OO-ANS in for a low pass during its northern hemisphere debut at Pardubice on 7 June. JAMIE EWAN

RAF Station Czechoslovakia's Avro Anson I MH120/OO-ANS made its northern hemisphere display debut at the Aviatická Pout' airshow at Pardubice, 60-odd miles east of Prague during the weekend of 7-8 June. Imported from New Zealand in May 2024, the world's only airworthy Anson I was reassembled by FAST Aero at Brasschaat, Belgium and made a 19-minute test flight on 1 June with RAF Station Czechoslovakia's founder Richard Santus at the controls, high winds having prevented a first flight over the previous few days and stimying a hoped-for debut at the Shuttleworth Collection Military Air Show on 31 May. The Anson was flown to its new base at Podhorany u Ronova on 1 June, a three-hour 27-minute flight from Brasschaat.

Two weeks after arriving at its new base, a complete and partially restored Anson I fuselage from a former Royal Australian Air Force machine previously owned by Bill and Robyn Reid — who restored MH120 between 2003 and 2012 near Nelson, on New Zealand's South Island — reached Podhorany from New Zealand. It was accompanied by a host of Anson spares.

Anson MH120 wears the markings of K6183, an Anson I from Bircham Newton-based Coastal Command unit No 206 Squadron, flown by Plt Off Laurie Edwards of Patea, New Zealand on 5 September 1939. That day he became the first RAF crew member taken prisoner by the Germans, just 48 hours after hostilities commenced. On patrol over the North Sea, Edwards spotted a Heinkel He 115 off the Frisian Islands, and during the subsequent engagement the gunner, LAC John Quilter was killed, leaving Edwards just the forward-firing .303 machine gun with which to continue the fight. The Anson went down in the sea and exploded, the badly burned Edwards being the only survivor, picked up by the He 115 crew before going into captivity.

The RAF Station Czechoslovakia Anson was originally constructed at the Avro factory at Yeadon near Leeds during 1943, and on 20 March 1944 arrived at No 2 Aircraft Park at Bankstown, New South Wales for use under the Empire Air Training Scheme. It flew with No 1 Air Observers School at Evans Head, on the New South Wales coast, and the Advanced Flying and Refresher Unit at Deniliquin. In 1953 it was acquired by Greenfield's Air Taxis of Albury, New South Wales, and nearly 40 years later achieved fame painted as Roscoe Turner's Boeing 247D NR257Y in the 1990 TV mini-series *Half a World Away* about the 1934 MacRobertson Air Race.

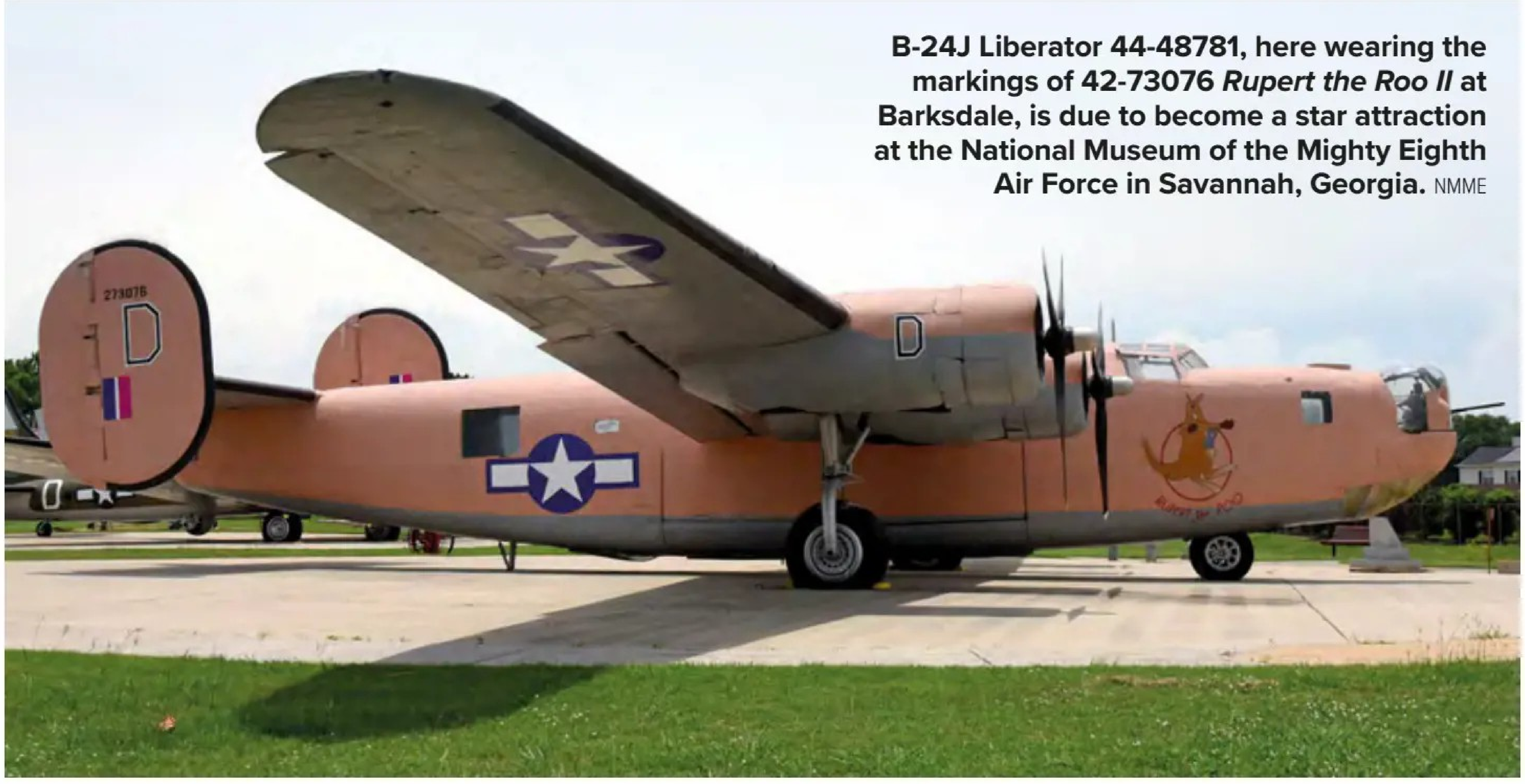
TFC Lysander arrives at Duxford

The former Sabena Old Timers Westland Lysander IIIa, V9546/OO-SOT, arrived at Duxford in mid-June following its recent acquisition by The Fighter Collection. It has been re-registered as G-LYZY. The aircraft was dismantled at Brussels-Zaventem, its long-time home with the Old Timers, and roaded to the UK.

One of the highlights of OO-SOT's previous flying career was a visit to Duxford for the Flying Legends show in 1998, when it made up one-third of a memorable Lysander trio. This was the only time to date that three examples of the type have flown together in preservation.

Lysander G-LYZY being dismantled in Brussels, ready for transportation to Duxford. BENOÎT DENET

8th Air Force museum to get a B-24



B-24J Liberator 44-48781, here wearing the markings of 42-73076 *Rupert the Roo II* at Barksdale, is due to become a star attraction at the National Museum of the Mighty Eighth Air Force in Savannah, Georgia. NMME

On 13 June the National Museum of the Mighty Eighth Air Force at Savannah, Georgia, announced that Consolidated B-24J Liberator 44-48781 is to be relocated there from the Barksdale Global Power Museum at Bossier City, Louisiana by its owners, the National Museum of the United States Air Force.

Currently painted in a Mediterranean theatre desert sand livery to represent B-24J 42-73076 *Rupert the Roo II*, the 1944 Willow Run, Michigan-built bomber is one of three Liberators owned by the NMUSAF, the others being B-24M 44-41906, currently displayed at Castle Air Force Base, California, and B-24D 42-72843 *Strawberry Bitch* which is on show at the NMUSAF itself in Dayton, Ohio.

The Savannah-bound bomber was delivered to the US Army Air Forces on 10 August 1944, but stayed in the USA and saw no combat prior to being struck off charge in December 1945. Sold to the Spartan School of Aeronautics at Tulsa, Oklahoma the following year for use as an instructional airframe, it was retired by the school during 1960, the stripped-out, engineless airframe sitting in open storage until being acquired by the then USAF Museum and moved to Barksdale in December 1978.

"Our main priority is the preservation of the historic bomber, *Rupert the Roo II*", said Maj Gen Jason Armagost, Eighth Air Force and Joint-Global Strike Operations Center commander. "By rehoming to the Mighty Eighth Museum, it will allow the artefact to be kept alive and well for generations — a gift made possible not only by the air force, but generous benefactors who understand the importance of World War Two heritage."

The B-24 will join Boeing B-17G Flying Fortress 44-83814 *City of Savannah*, and the composite nose and cockpit section of B-24D '42-40506' *Fightin' Sam*, which was built up using the glazed nose of RB-24D 41-11874 and the cockpit of B-24J 42-51457. That nose section was displayed at the American Air Museum at IWM Duxford, UK from November 1995 until being replaced there by another, complete, Ford-built bomber in the shape of B-24M 44-51228, which was officially dedicated in a ceremony attended by former President George H. W. Bush in March 2001. *Fightin' Sam* arrived at Savannah during 2004.

Scott Loehr, president and CEO of the National Museum of the Mighty Eighth Air Force commented, "This museum is forever grateful to the NMUSAF and the Eighth Air Force for entrusting this significant historical object to its care and public exhibition."

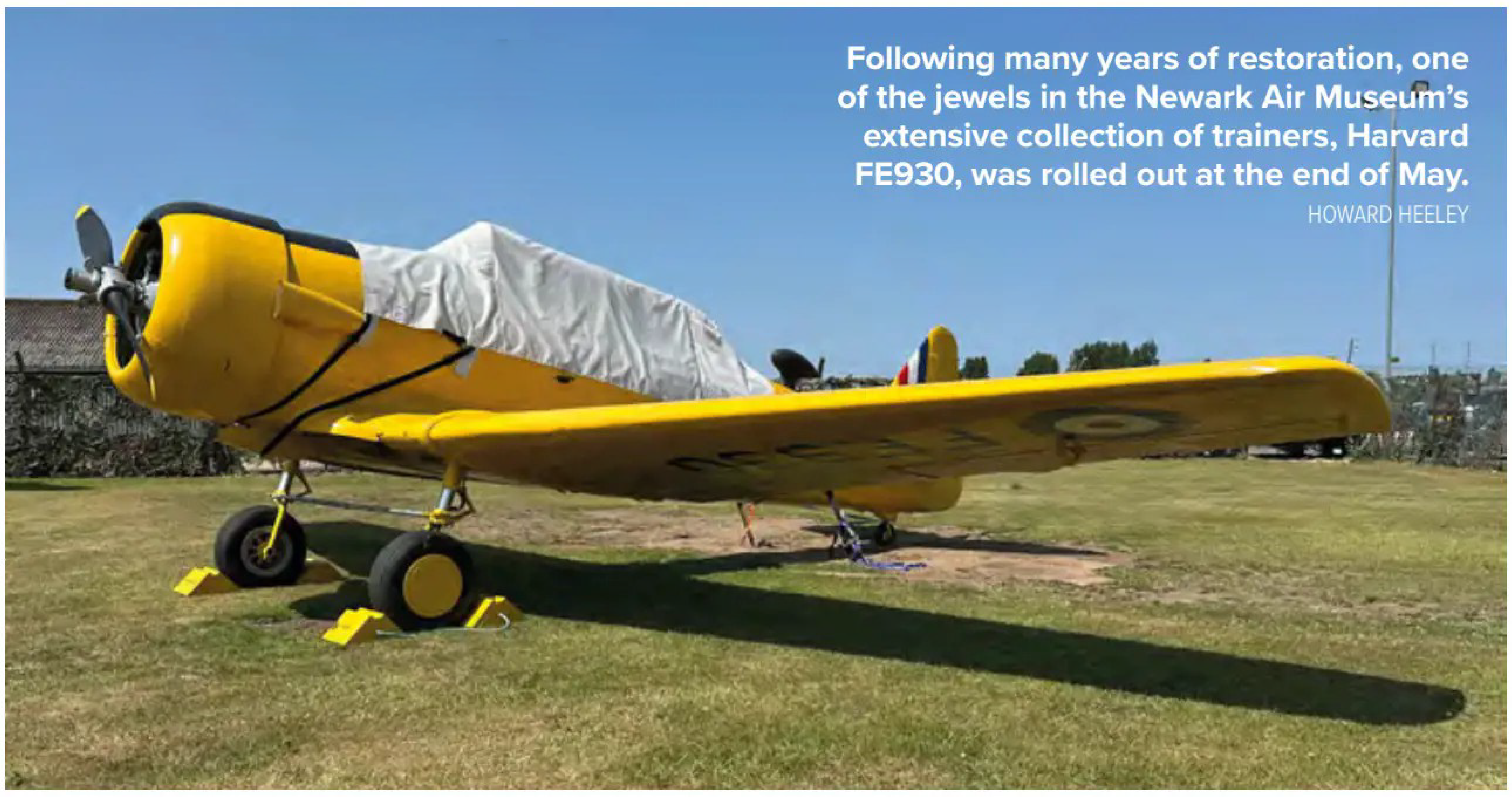
Following restoration, the B-24 will be the centrepiece of the National Museum of the Mighty Eighth Air Force's multi-million-dollar capital improvement programme, 'Maximum Effort'. The museum expansion and new permanent exhibitions are scheduled for completion in late 2026.

Aerospace Bristol gets R-R engine collection

The Aerospace Bristol museum, located at the old Filton airfield north of the city, will soon boast a new display building containing a significant collection of historic Rolls-Royce engines. The museum is working in partnership with Rolls-Royce and the Rolls-Royce Heritage Trust to develop Hangar 16R, which will house engines from the RRHT collection alongside other museum objects on show for the first time. The partnership will also provide a space for RRHT volunteers to work on conserving the collection of engines, which include the nine-cylinder, single-row Bristol Pegasus and the 14-cylinder, two-row Hercules, and the post-war Olympus and Pegasus alongside a number of rare experimental powerplants. The development of Hangar 16R has been made possible thanks to a £180,000 donation from Rolls-Royce to the Bristol Aero Collection Trust, the charity behind Aerospace Bristol.

Hangar 16R at Aerospace Bristol, being renovated to house the Rolls-Royce Heritage Trust engine collection. AEROSPACE BRISTOL

NEWARK HARVARD PROJECT ROLLED OUT



Following many years of restoration, one of the jewels in the Newark Air Museum's extensive collection of trainers, Harvard FE930, was rolled out at the end of May. HOWARD HEELEY

At the end of May, after many years of restoration work by staff and volunteers at the Newark Air Museum, North American Harvard IIb FE930 was moved out of the on-site workshop and partially reassembled.

Throughout its service career the aircraft carried various military identities and it has been repainted in the yellow colours and markings it wore while being operated from Medicine Hat, Alberta, by the Royal Canadian Air Force during the 1940s. This colour scheme has been selected as a tribute to the hundreds of RCAF personnel who trained with No 1661 Heavy Conversion Unit at the wartime RAF Winthorpe, where the Newark museum is now located. Some additional rebuilding has been completed on FE930 and it was repositioned into its display location, alongside the car parking area on one of the airfield's former taxiways, in mid-June.

PROTOTYPE HERON GETS ENGINES

At the Moorabbin Air Museum in the south-eastern suburbs of Melbourne the prototype de Havilland DH114 Heron, VH-CJS/G-ALZL, had the number two and three 250hp DH Gipsy Queen 30 engines refitted in mid-June, and the undercarriage was also recently reattached. Last operated by Amalgamated Air Services at Perth's Jandakot Airport in June 1976, the historic machine passed through the hands of several potential restorers in Western Australia over the following three decades and looked set for the scrap-man's blowtorch before being acquired by the Moorabbin Air Museum and moved to Melbourne in 2013.

First flown by DH test pilot Geoffrey Pike on 10 May 1950, in a highly polished natural metal scheme, 'ALZL was painted in BEA colours in August 1951 and used to evaluate a Northolt-Channel Islands service, carrying a total of 5,000 passengers over five successive summer weekends. During early 1952 it flew to Oslo for demonstration flights for the Norwegian airline Braathens SAFE, and in July displayed at the Farnborough show in Japan Air Lines markings. April 1954 saw the machine being registered LN-BDH to Braathens, which had purchased two other Herons in 1952, but following the one-month lease the machine returned to de Havilland prior to its sale to Jersey Airlines in June 1955, with whom it operated until November 1962.

The starboard inner Gipsy Queen is gingerly reinstalled on Heron G-ALZL. MAM

Two years with Birmingham-based Executive Air Transport were followed by a year-long lease to English Electric at Samlesbury as an executive transport, Emerald Airways in Belfast then taking 'ALZL on in August 1965 for service in Ireland and Scotland. Another three years in Scandinavia with several operators began in December 1966 with Dan-Fly in Denmark, before the Heron went to Australia in 1973 on contract to the WA Petroleum Company carrying staff and equipment to oil and gas fields in Western Australia. Thankfully, this varied career can again be celebrated as the restoration of a very rare civil airliner prototype continues.

NEWS IN BRIEF

ANDERS JONSSON VIA JAN FORSGREN

SAAB S 18A TV NOSE REPLICA RESTORED

At the Flygmuseet F 21 in Luleå, northern Sweden, restoration of a Saab S 18A forward fuselage replica was recently completed. Originally constructed for the 1989 television drama *Tre kärlekar — Three Loves* — the section was mounted on a Citroën car, notable for their smooth suspension travel, for filming the flying sequences.

TIGER GOES ON SHOW AT BOTTISHAM

Following donation by the Imperial War Museums, DH82A Tiger Moth 'N6635' went on show at the Bottisham Airfield Museum in early June. The type was the first to land at RAF Bottisham when it opened in March 1940, and the last to leave when the airfield closed in January 1946.

'SHAR' ARRIVES AT DUXFORD

In preparation for the changes to Duxford's AirSpace hangar, Sea Harrier FA2 ZA175 arrived at the Cambridgeshire airfield in early June. Owned by the IWM, the ex-Royal Navy fighter — a Falklands combat veteran in earlier Sea Harrier FRS1 guise — had been on loan to the Norfolk and Suffolk Aviation Museum at Flixton since 2004. In return, the Flixton collection has received Jaguar GR1 XX108 from Duxford. BEN DUNNELL

HAVOC HEADS BACK TO PNG

Former USAAF 388th Bomb Squadron Douglas A-20G Havoc 42-86786 *Hell 'n Pelican II* was shipped from the RAAF Amberley Heritage Centre in Queensland to the Papua New Guinea National Museum and Art Gallery in Port Moresby in early June. The light bomber was recovered from the site of its April 1944 forced landing near the Gogol River in PNG during 1984 and transported to Amberley for restoration.

RAAF

FAGEN FIGHTERS RESTORATION

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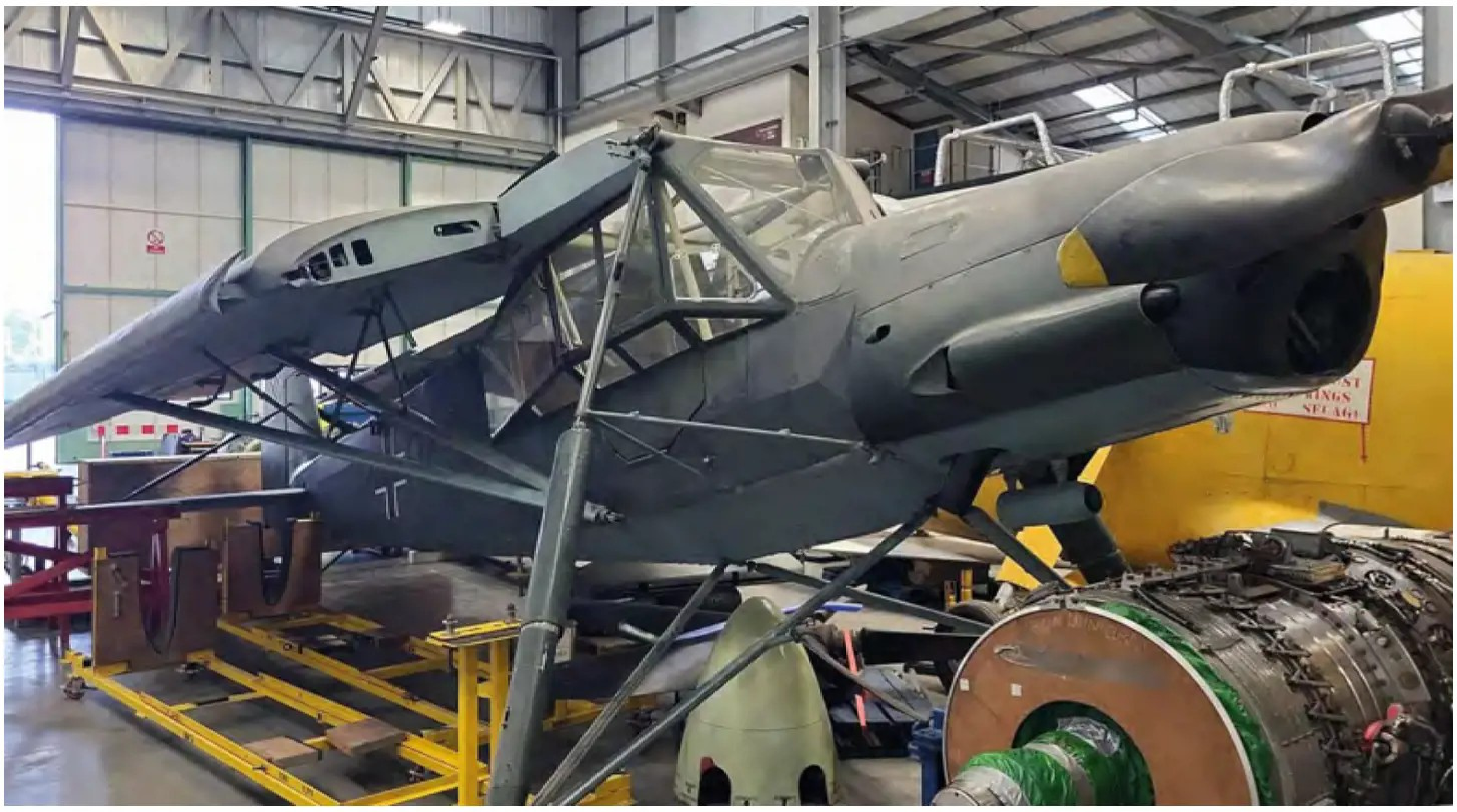
Storch for Hawkinge museum



Fi 156C-7 Storch Werknummer 475081, ready at Cosford on 17 June for transportation to Hawkinge. KEVIN HODGES

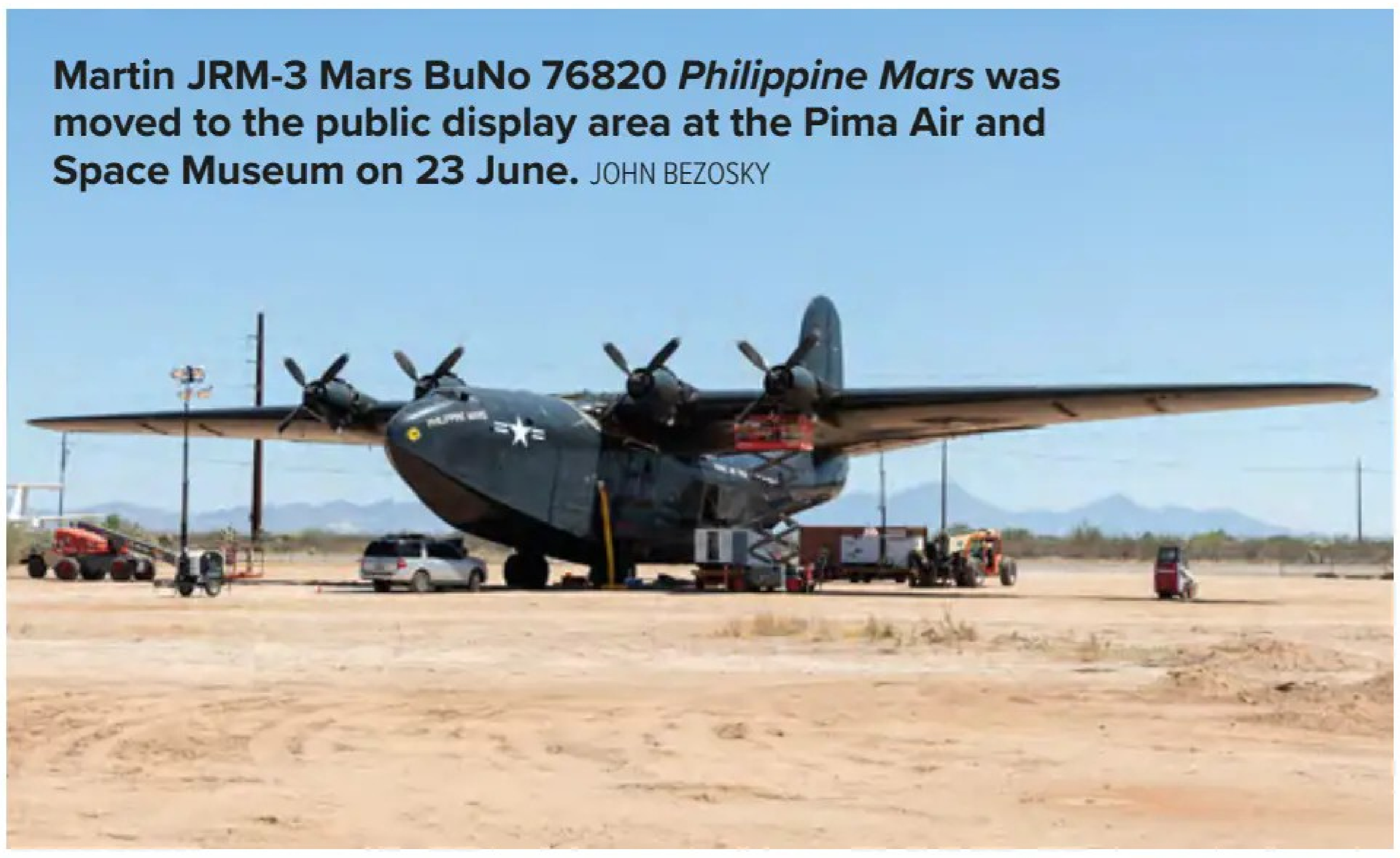
On 18 June the Kent Battle of Britain Museum at Hawkinge announced the acquisition of Fieseler Fi 156 C-7 Storch Werknummer 475081 from the RAF Museum.

For many years the museum's chairman, Dave Brocklehurst MBE, has been searching for several key airframes to add to the collection and to depict critical aircraft flown during the Battle of Britain, including those that would have been seen over Britain had Operation 'Sea Lion' taken place. He says, "We are extremely pleased and excited to have acquired this rare and important airframe, which was built by Mráz at Chocen, Czechoslovakia during 1944. It was one of three Fi 156s that were surrendered at Flensburg, Germany, part of the British occupation zone, in May 1945. It took part in the Battle of Britain Open Day at RAF Hendon in September 1945 and was demonstrated by Lt Cdr Eric M. 'Winkle' Brown, who became a good friend and supporter of the museum.

"During the museum's winter closure period of 2025-26 the Storch will undergo a full strip, renovation and repaint as one of our main winter projects. We are still considering what colour scheme it will carry for 2026 but it will either depict the personal aircraft of Generalfeldmarschall Albert Kesselring, the commander of Luftflotte 2 during the Battle of France and Battle of Britain, or a Staffel hack from Jagdgeschwader 26."

The Kent museum, working closely with staff from the RAFM and from contractor GJD Services, was expecting to move the Storch — which had been exhibited at Cosford since 1989, following restoration in the course of a lengthy period at St Athan — to Hawkinge on 26 June.

Mars goes on show at Pima



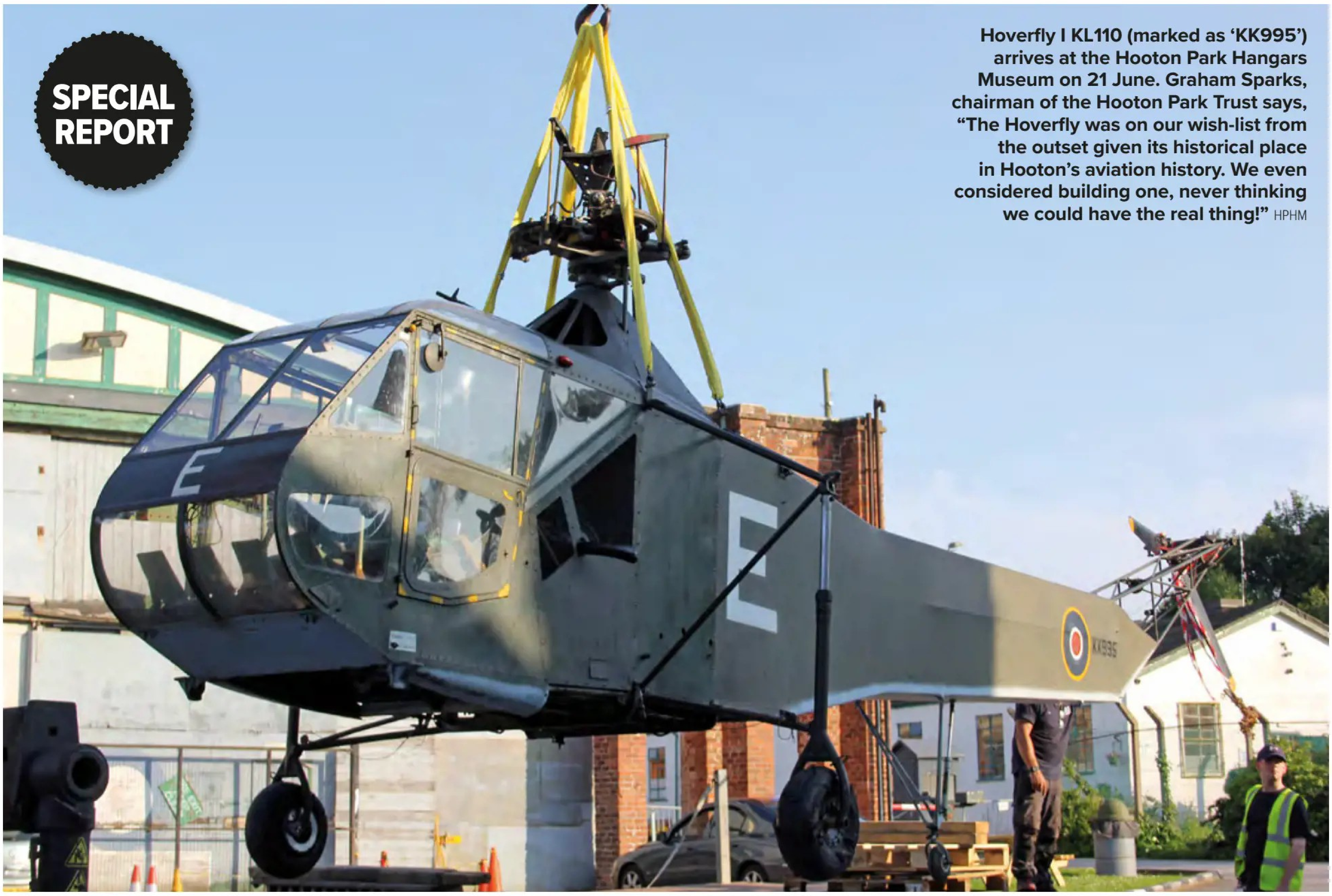
Martin JRM-3 Mars BuNo 76820 *Philippine Mars* was moved to the public display area at the Pima Air and Space Museum on 23 June. JOHN BEZOSKY

On 23 June, 83 years after the first prototype Martin XPB2M-1R Mars made its maiden flight at Middle River near Baltimore, Maryland, the last example to fly, Martin JRM-3 Mars BuNo 76820 *Philippine Mars* was rolled from the cordoned-off reassembly zone into the public display areas at the Pima Air and Space Museum at Tucson, Arizona. Following its arrival by road from Lake Pleasant on 16 May (see News, *Aeroplane* July 2025), contractors, including a specialist team from Southwest Industrial Rigging, undertook the monumental task of reassembling the leviathan, the largest Allied aeroplane to see service during the Second World War. The public debut of the Mars at its new home was on 14 June, when a 'Night Ops' evening event was staged in the reassembly area.

Coincidentally, the largest American aircraft built during the war years, the single Boeing XB-19 heavy bomber prototype, with a length of 132ft 4in (the Mars is 117ft 3in long), a wingspan of 212ft (the Mars measured 200ft), a height of 42ft (38ft 5in for the Mars) and a wing area of 4,285 square feet (as opposed to the Mars' 3,686 square feet) was scrapped at Tucson during June 1949. That was just 17 years before the concept for the Pima Air Museum was floated by personnel at Davis-Monthan Air Force Base and the Military Aircraft Storage and Disposition Center, who recognised that World War Two and early post-war aircraft types still stored on the site would rapidly disappear into the local smelting machines. For more on *Philippine Mars*, see the feature on pages 56-63.

HUGELY HISTORIC HELICOPTER ARRIVES AT HOOTON

SPECIAL REPORT



Hoverfly I KL110 (marked as 'KK995') arrives at the Hooton Park Hangars Museum on 21 June. Graham Sparks, chairman of the Hooton Park Trust says, "The Hoverfly was on our wish-list from the outset given its historical place in Hooton's aviation history. We even considered building one, never thinking we could have the real thing!" HPHM

Eighty years after it first arrived with No 7 Aircraft Assembly Unit at Hooton Park, Cheshire, following a wartime sea crossing from Stratford, Connecticut to Ellesmere Port docks, Sikorsky Hoverfly I KL110 entered the Hooton Park Hangars Museum (HPHM) on 21 June following a considerably easier road trip from the RAF Museum London at Hendon.

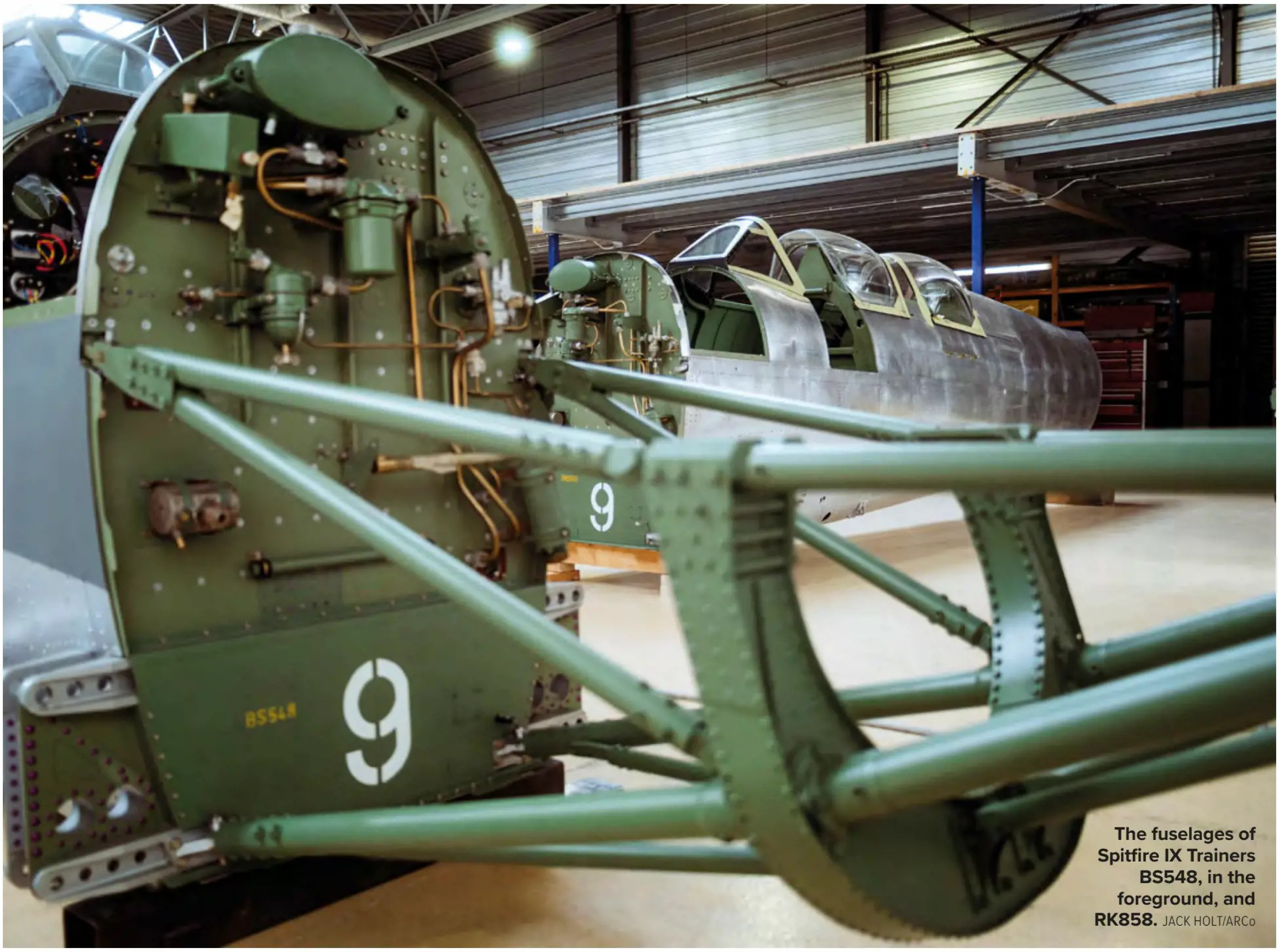
KL110 is the oldest military helicopter in the UK, and was scheduled to be on show to the public for the first time during the HPHM open day on 29 June. The chair of the Hooton Park Trust, Graham Sparks says, "The initial loan period is a year, to bring it in line with our other RAFM loan, Comper Swift G-ACGL. This is another example of the co-operation between a national museum and a small independent."

The Hoverfly had spent the past 53 years on display at Hendon, having been donated to the nascent RAF Museum by the College of Aeronautics at Cranfield during 1966. It was restored by personnel at No 71 Maintenance Unit at Bicester during 1968, and was on display at Hendon for the RAFM's gala opening by Queen Elizabeth II on 15 November 1972.

Of a total of 100 R-4Bs built by Vought-Sikorsky at Stratford, Connecticut for the US Army Air Forces, US Navy and US Coast Guard, 52 were sent to the UK under Lend-Lease during 1944-45. Named Hoverfly I, they were the first true helicopters to be operated by the RAF. The RAFM machine rolled off the Stratford production line on 27 December 1944, was initially accepted by the AAF as 43-46596, and on 5 January 1945 was delivered to Floyd Bennett Field, Newark. Six days later it was despatched by sea to the UK, being officially taken on charge by the RAF on 26 January while en route, arriving at Ellesmere Port on 3 February. Two days later it was roaded to Martin Hearn Ltd at No 7 Aircraft Assembly Unit, Hooton Park, for assembly. The first air test was on 27 February at Hooton Park, and on 2 March the Hoverfly arrived at No 48 MU at Hawarden for acceptance checks and storage. After removal from storage, on 22 October it was flown from Hooton Park to Cosford by Sgt James Wood Wilson, followed by two further flights that day, from Cosford to Wellesbourne Mountford, and Wellesbourne to Watchfield. It then went to the Helicopter Training Flight at the Andover-based No 43 Operational Training Unit, which had been operating the type since May 1945, flying nine Hoverflies to convert army AOP pilots in a five-week course involving 30 hours' flying instruction. A total of 29 army pilots undertook their rotary-wing transition this way.

During July 1947 KL110 was detached to the Airborne Forces Experimental Establishment at Beaulieu, Hampshire for the training of King's Flight pilots, and on 28 August, on transfer to the King's Flight, it began carrying mail between RAF Dyce, Aberdeen and the royal residence at Balmoral, making a Dyce-Balmoral run each morning with a return service later in the day to connect with the regular mail flight to London. It was one of four Hoverflies with the King's Flight at the time, finished silver overall.

With the withdrawal of the Hoverfly from RAF service in January 1949, KL110 was transferred to the Royal Navy and flown to RNAS Gosport for operation with 705 Naval Air Squadron. Struck off charge on 26 May 1951, KL110 was allocated to the College of Aeronautics at Cranfield, painted blue, and used in ground vibration/resonance tests.

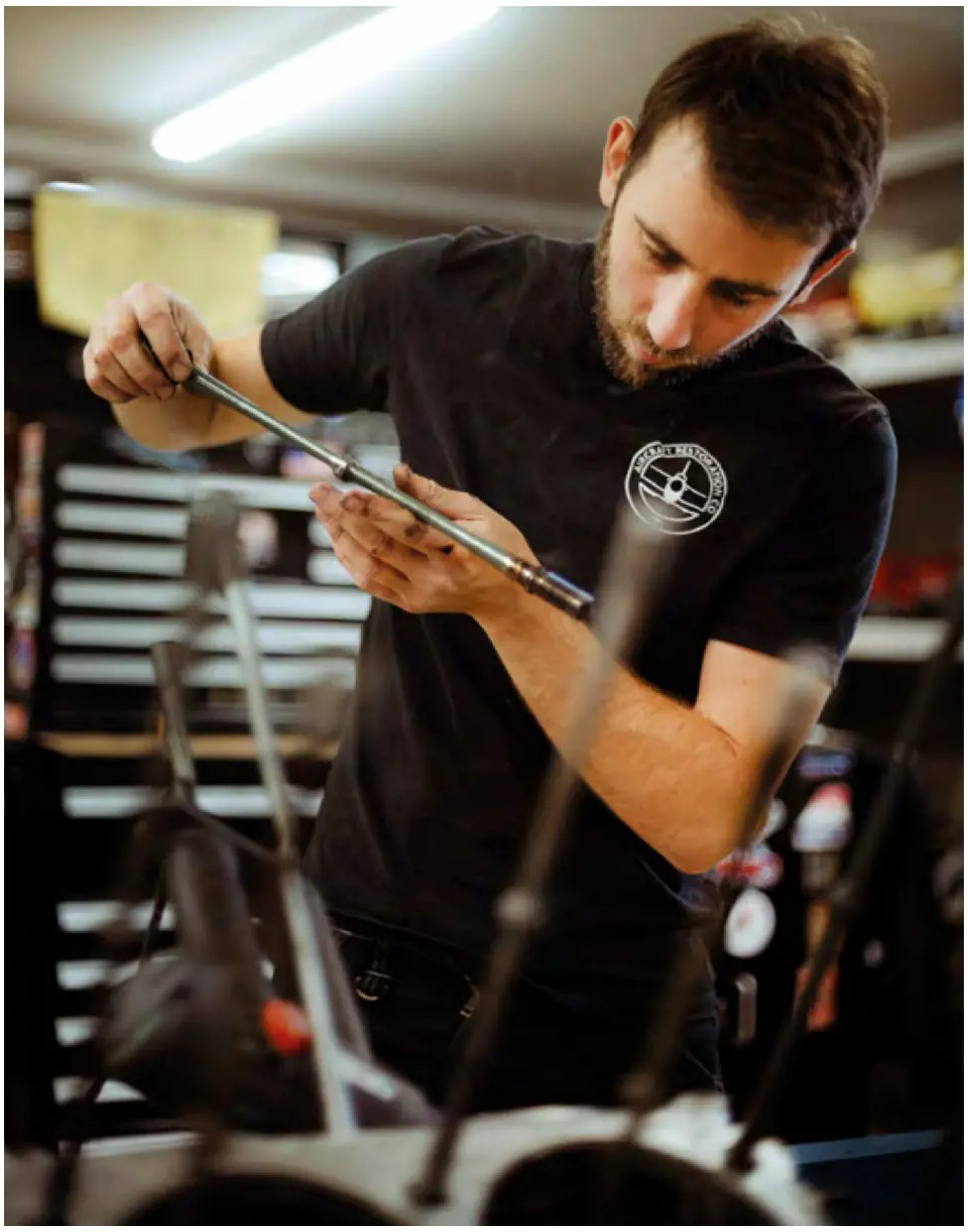


The fuselages of Spitfire IX Trainers BS548, in the foreground, and RK858. JACK HOLT/ARCo

RISING TO THE CHALLENGE

"There's more than enough for us to get on with", says John Romain of the current projects at the Aircraft Restoration Company — and, in typical fashion, they're giving the engineers opportunities unique in the preservation world **WORDS:** BEN DUNNELL

ARCo team member Lisa in the workshop fabricing a Spitfire rudder. GEORGE ROMAIN/ARCo



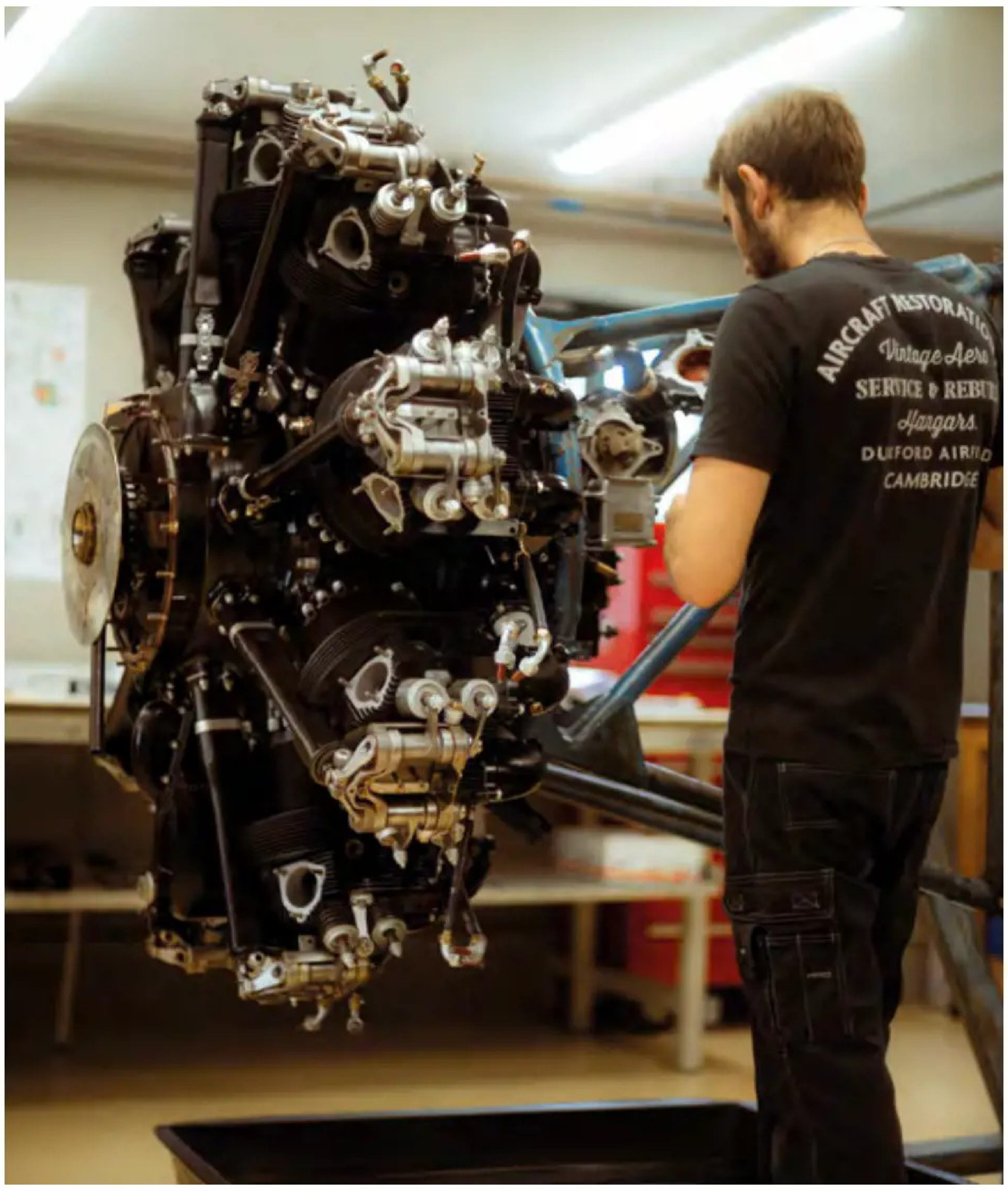
In the engine shop, Tom sees to the early Rolls-Royce Griffon for the Firefly I. JACK HOLT/ARCo

Exactly how many years of expertise with historic aeroplanes are contained within the Aircraft Restoration Company is impossible to calculate. From the top down, though, the figure certainly adds up to decades. And in that time it's been a trendsetter, for it was in the vanguard of developing a restoration business on a significant commercial scale. That didn't used to be a feature of the scene. Today it very much is.

Yet despite having brought about a good deal of the industry's development, ARCo has advanced in ways that could not have been foreseen. Some of that process has represented a natural progression. Other facets are a consequence of particular projects and their special requirements. The airworthy results aside, the most obvious manifestation of this can be found in the large, modern, purpose-built complex at the eastern end of IWM Duxford which the company calls home. Myriad aircraft which have emerged from its twin hangars tell their own story, but they are just one element of it.

Managing director John Romain has, of course, spent most of his life working on and flying vintage aircraft. That much we detailed in our '*Aeroplane* meets...' feature in the March issue. But what of the present day — of what it takes to run what is now a sizeable enterprise, of how it seems set to develop, and the restoration efforts currently under way? Time to visit his office and talk to him again.

In that previous interview, John reflected on how the two Blenheim restorations in which he was a driving force acted as a spur for everything that's followed. Also there's been another individual aspect that's shaped ARCo's evolution: the award of contracts by the Ministry of Defence for maintenance and major servicing on aircraft belonging to the Battle of



A Bristol Mercury radial engine for the airworthy Blenheim being worked on by Tom. JACK HOLT/ARCo

Britain Memorial Flight, first the fighters, now the multi-engined types.

"We've been doing various contracts with BBMF for, probably, the past 20 years", says John. "It started off with fighters: an implementation to do the 'majors' on their fighters. That moved into all the fighters being, fundamentally, put back to a 'line in the sand' in terms of the big items. For instance, all the Spitfires had wing spar changes and the Hurricanes went through a similar process with the main items being looked at, renewed or NDT-ed [subjected to non-destructive testing].

> ***"The RAF contracts are getting bigger and longer"***

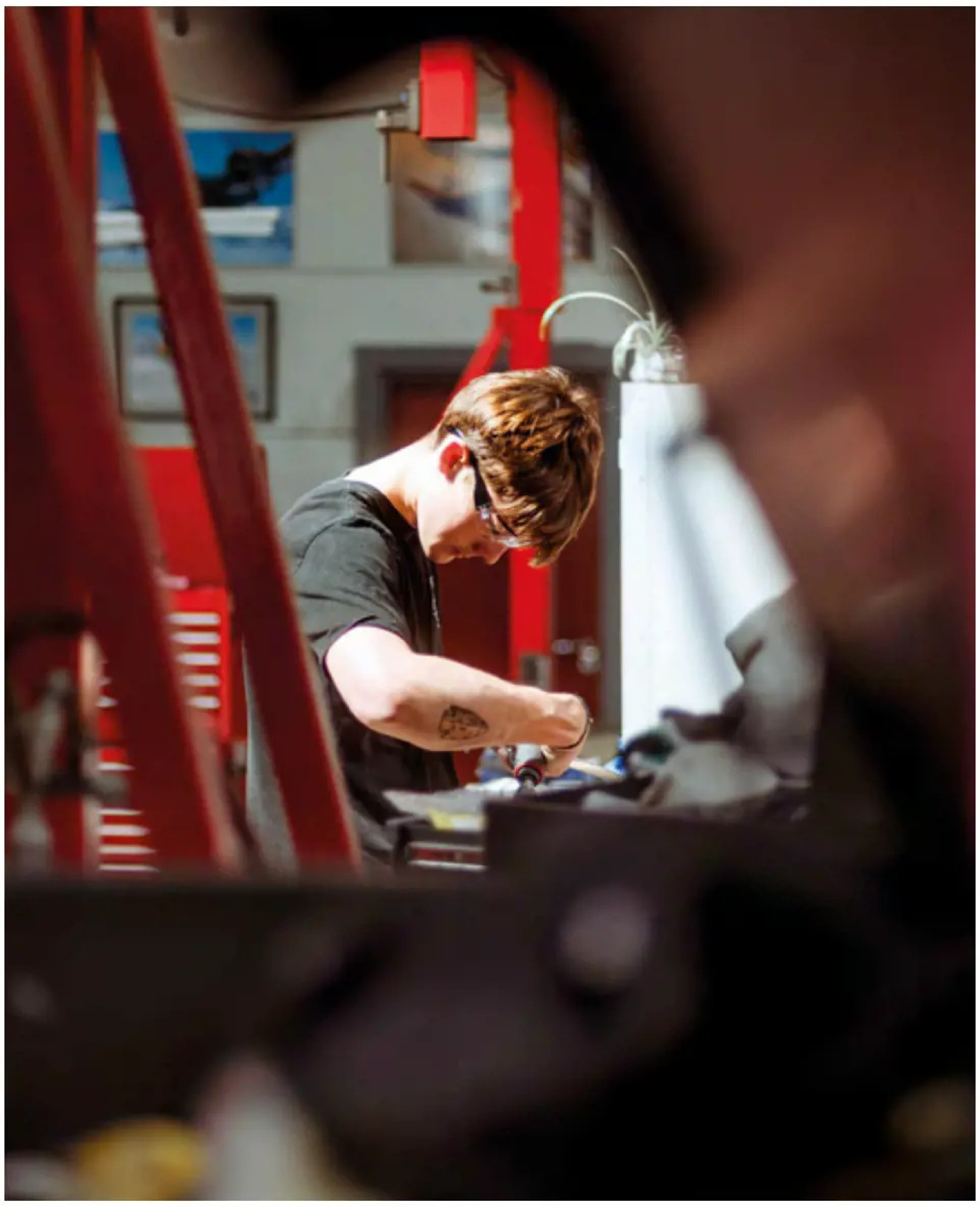
"They had a concern many years ago that they really didn't understand where the aircraft sat with regard to any possible fatigue life or their previous use. There isn't a fatigue life on a Hurricane or a Spitfire as an airframe. There are various parts of them that have got NDT requirements to re-life, but the aeroplanes don't sit in a fatigue life and they're not recording a fatigue index on them. So, we went through all that process. Then it moved back into the majors.

"Meanwhile, they asked us whether we could look at the Lancaster/Dakota as a contract. We hadn't got the room; certainly, we would have struggled to get a Lancaster into this hangar, Building 425. That brought up the need to build 426, which is now called the Stephenson Hangar. It was primarily built to house the Lancaster, for that contract. It does a lot more now, of course, and it's sort of our showcase hangar. That's where the boardroom is, where all the new offices are. And that's where we do all of the routine maintenance and the operational maintenance on a day-to-day basis. Every day you walk in there, it's different. The aircraft have all moved, some have gone, some have come back. Today, for instance, we're doing some SSAC [Safety Standards Acknowledgement and Consent passenger flights], so the two-seat 'Spits' have been prepped ready to go. Yesterday it was a completely different look in there.

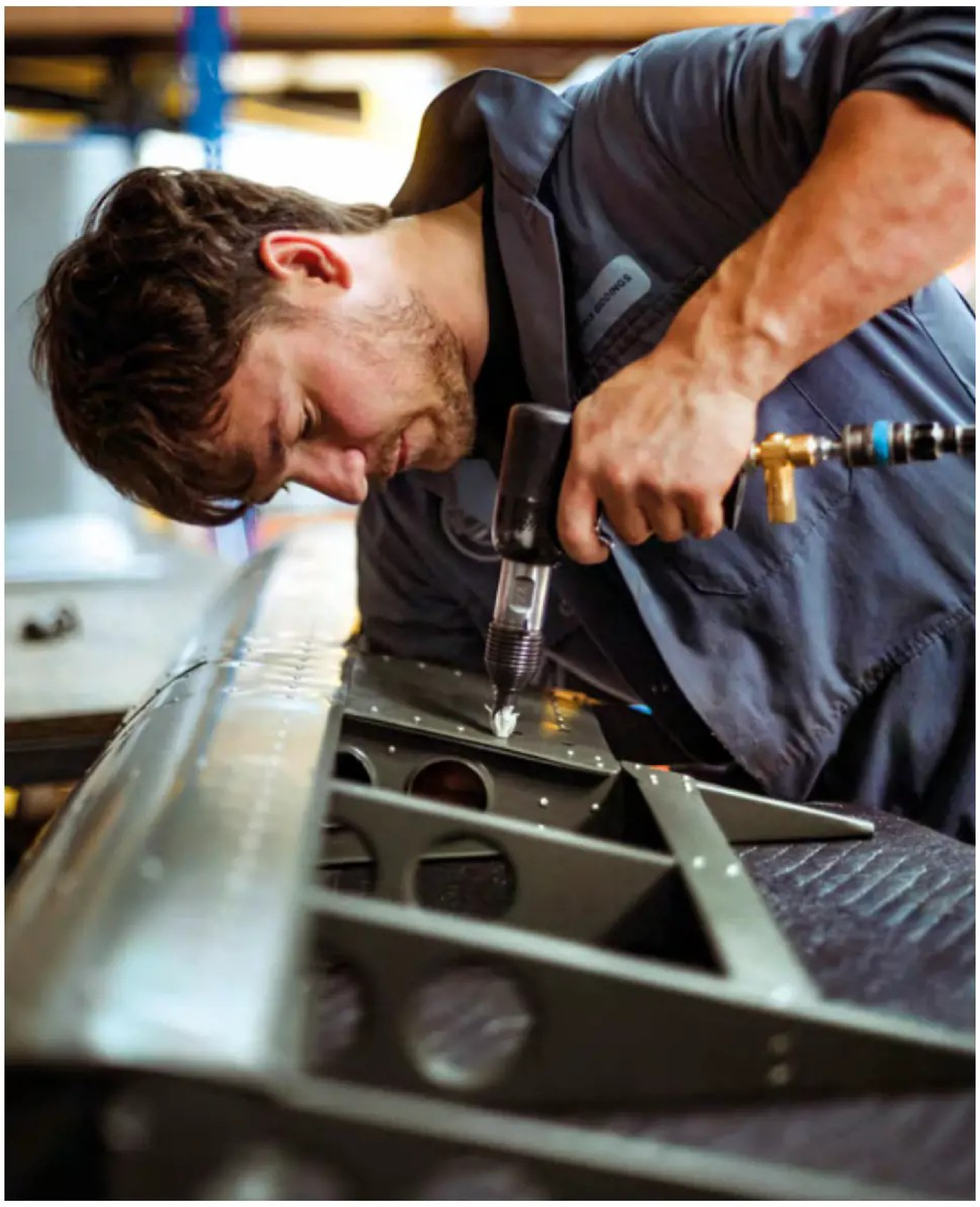
"We got the Lancaster contract, and we've done it for a number of years now. The RAF's Lancaster does have a number of items that are fatigue-lifed; one of them is the tailplane. That was coming up against its fatigue life, and the fatigue life is a scrapping life. That's it. There's no NDT or anything that can be put to the tailplane to re-life it. The RAF came to us and asked if we could build a brand-new set. Initially we said we were sure we could, but it was a question of how we were going to do it.

"We got two sets of tailplanes in, one of which came from Canada, off a static aircraft out there. Then we built the jigs from those other tailplanes. We did a quick check by removing the RAF aircraft's tailplane while it was still in service and putting it in the jig over a winter period to make sure our jig was correct for those tailplanes as well, which, of course, it was. It went back on the aeroplane and we then started the process of building the brand-new tailplanes. It was a huge engineering task, because the main spar has got a little bend in it, so it was a challenge trying to get the raw material — which eventually came from America — and creating the tooling to put the bend into it.

"It also has a thing called a plug rivet, which is a unique Avro way of holding skins to main spars. There is a threaded hole which goes into the main spar, and then there is a rivet that is punched in over the skin, through into the hole. It bottoms out into the hole and then spreads, and the material spreads into the thread you've cut into the main spar. That's how it locks. To get it out you can actually unthread it. The flight had been suffering with plug rivets for many, many years, coming loose, not



Above, one of ARCo's current engineering apprentices, Milo, tackles Spitfire I wings. Below, a wingtip for Spitfire RK858 in the hands of Richard. JACK HOLT/ARCo



Typifing the range of types ARCo has in its care at any one time, Lewis rivets a Stearman aileron (above); Spitfire RK858's wings on build (below). JACK HOLT/ARCo

knowing how to change them. When they were being changed they didn't always go down too well. A lot of research went into that, to make sure we could do it properly. Ironically, on the Canadian tailplane we had here they'd overcome the problem during production by putting piquet screws in, but we weren't going to be allowed to do that."

Having been in for a major service during 2016-17, PA474 emerged from its most recent stay with ARCo back in 2021, this involving a so-called minor maintenance programme which, in truth, was not far off a major. After that came the tailplane replacement in 2023-24, for which the aircraft remained at Coningsby while the tailplanes themselves were worked on at Duxford. It was a true milestone in the preservation world: the first new set of Lancaster tailplanes built for nearly eight decades.

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Next on the agenda as regards BBMF work was Dakota ZA947. "The first major we did with the Dakota we actually did via Eastern Airways at Humberside; we positioned it there and we used Richard Lake's company to help us. That all went well, and now it's back here on its latest major". ZA947 is now finished in the colours of No 31 Squadron, South-East Asia Command.

In what way does John characterise the manner in which this side of ARCo's portfolio has developed? "The contracts are getting bigger, longer, more difficult to do is probably how I'd put it. The contracts in the past had come to the civil world because they had concluded that they hadn't got the people within the air force to do things like major inspections, and also they wanted to put them out to a new set of eyes to look at them. They had a relatively small project team, or PT as we know it, and a lead engineer. Now it's very much controlled by the Military Aviation Authority in terms of the audits, the admin side and everything that follows up. The PT is much bigger in consequence.

"The whole thing has grown, and it makes it a bit more difficult to deal with, especially with the audits and how the MAA looks at the historics within the RAF. Most of the people we see here for the audits are used to going into big establishments which have the modern helicopters or the modern jets, and they tend to look at vintage aircraft in the same way, with the same set of rules. Of course, you can't do that. There are many discussions between us about how we bring vintage aircraft into their rules, or change their rules to hopefully allow vintage aircraft to operate in the way they have to operate and have to be maintained.

"A lot of time goes into the administration of it now, far more than ever before. Certainly, from a paperwork point of view — the physical pieces of paper — it's much, much bigger than it used to be. Our staffing levels have had to go up. We've had to bring in full-time quality people, full-time document controllers for all of that type of work, which we didn't have to do before. You have to have these separate, allocated personnel.

"The numbers you employ just keep on going up and up, which has to be very carefully controlled. It's so easy for a private company to lose track of what you're really trying to achieve, and you can certainly end up in a position where you're just running to walk. You're busy, busy, busy, everyone's rushing around trying to achieve things, but actually, when you look at the end-of-year numbers, you've done very little in terms of finances and growing the assets of the company.

"I learned a huge amount from Karel Bos" — the Belgian businessman who acquired Historic Flying and moved it to Duxford, to be based alongside ARCo — "about running businesses, and it always goes down to cashflow and personnel. Those are the two big things you have to look after. The rest of it you can 'manoeuvre'. We have upwards of 70 people working here today. An amount of those are obviously on the big, long-term contracts, of which BBMF is one. The rest are on the other big contracts that we have."

And they don't come much larger than Focke-Wulf Fw 189 A-1 Werknummer 2100, the world's sole survivor of the very distinctive twin-boomed, twin-engined wartime Luftwaffe reconnaissance type. This 1941-vintage machine, built by Aero in Prague, was in service on the Eastern Front when it was brought down by Soviet Air Force Hurricanes on 4 May 1943. Recovered in 1991, the remains came to the UK the following year in the ownership of West Sussex-based crop-spraying pilot Jim Pearce. A rebuild later started in Britain and Germany, but was not destined for completion. Then it went to the USA, only to be brought back across the Atlantic, work by ARCo on behalf of its then owner starting in May 2016. It has since been sold again, and the Fw 189 is under active restoration once more.

> ***"There are more than enough projects for us to get on with"***

"When we first had that project", recalls John, "it was not going to fly. It was to be built as if it could fly from an airframe point of view, but it was not to be systemised and everything else for flight. That changed with the new owner, and now it is to fly. It's a very exciting project because it's the only one. The engineers working on it are enjoying the challenges of it, because it's bringing in a lot of engineering challenges. It's different to Spitfires; all the boys working on it, or the majority of them, have built many Spitfires. They can do that very well, and very easily in comparison. It'll be very special the day it goes outside the hangar to see a complete, flyable Fw 189. Incredible."

The team of engineers which tackled the Lancaster tailplanes moved on to the Focke-Wulf. "There are a number of drawings around that we've managed to find for the 189, and we found a number of manuals. In fact, recently a new client of ours just happened to mention that he'd got a set of manuals… But, other than that, there's not too much around. The majority of 189s were built by the Aero factory in Czechoslovakia, and through our links with the L-39s we started a route into their archive to see if they still had drawings. It didn't really come to fruition, but it's still bubbling away that it may.

"It's always difficult trying to find information, which, of course, means a lot of it we have to reverse-engineer and create the drawings ourselves. That's an ongoing process every day here, not only with things like the 189 but, for example, the Lancaster tailplanes. There was not a full set of drawings for the tailplanes, so we had to create our own. We're still creating Spitfire drawings, because there's not a full set anywhere. When we come up against an item that, finally, the industry has run out of and we've got to manufacture them, of course we have to reverse-engineer, do the drawings, change the material if we need to.

"Then there are the processes. Obviously, during the war and through high manufacture, many, many parts were stamped or forged. Our quantities are very low in comparison, so we wouldn't think of tooling up to stamp items. We've got new Spitfire undercarriage legs being manufactured at the moment, which are big forgings, but normally we would go the modern machining route. That can bring in some complications with stress paths in the material, and of changes of material at the same time and how that's going to work. We've got two full-time people on that development, and a big part of what we have to do is drawing office work, research and stress analysis. Our own full-time inspection department has all the right computerised measuring equipment. Again, that's what we have to have. To support everything that's

The BBMF Dakota, ZA947, being readied for an engine run.
JACK HOLT/ARCo

Restored by ARCo as a two-seater, Spitfire RK858 first arrived at Duxford back in 1992 when it was recovered from Russia by The Fighter Collection. JACK HOLT/ARCo

happening in both hangars on a day-to-day basis, there's a lot going on behind the scenes."

Another aeroplane requiring a learning process and a great amount of forensic investigation is Walrus I W2718/G-WLRS. Rather akin to the Fw 189 in having been a very long-term return to flight, the characterful Supermarine amphibian came to ARCo in 2018 after acquisition by a new owner. John says, "We're doing the research on that now, and certain parts are being worked already. It's another unique challenge, and again a one-off it'll be fantastic to see rolled out.

"There are lots of projects that are keeping us busy, but which are also giving the engineers the diversity and the interest, so it doesn't become too much of a mundane job. Some people on the outside of it would think, wow, the thought of going into a hangar and working on a Spitfire all day would be their dream. However, do it for 10 years and, OK, it's another Spitfire, or whatever it is. It's always good to give the diversity across the team.

"Also, with lots of the engineers — me included, to a point — you enjoy the restoration and the engineering and the build immensely, and when you finish a project the blues set in a little bit, because you've lost your target and you've lost the satisfaction for a while. What I try and do is integrate a new project before the one they're currently working on is finished. Then, thought processes start to go to the next one, so by the time the current project is in the last few months or weeks, they're already thinking ahead.

"It's important to do that, and we're lucky in the current situation we're in where we've got a lot of work that we can do that. In days gone by it wasn't always the same. You'd finish a project and then you'd be looking for another one. We're not in that situation any more. There's more than enough for us to get on with."

Long-term clients have kept on coming back, but what about the new ones coming in? "Yes", says John, "there are some new ones. Not huge numbers of them, but then there never were. And some of them are young-ish people, which is even better. The client base is good. We've got some lovely clients and we've got some lovely projects. The order book, if you want to call it that, is full for the future."

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In turn, the revenue brought in by all this and the very important SSAC passenger rides help build up ARCo's own, core fleet. "That's how we started, really: working on our own aeroplanes, springing right back to the days of the Blenheim. Now our own fleet is quite large, and we add to that when we can and when we choose to with all sorts of projects. Currently we've got a third two-seat Spitfire on build, which is for us. We bought back the MkXVIII [SM845], which, of course, is an aircraft from the Karel Bos days. That's back with us. It's on repair. And we've got a lovely MkV project which is bubbling away in the background — the aircraft that had gone to Parnall in Cornwall. It's got fantastic history. It went through so many squadrons, and so many nationalities of pilots: Czechs, Poles, Americans, even flying down the beaches on a recon on D-Day out of Lee-on-Solent with an American squadron. That's an exciting aeroplane."

It is indeed. Spitfire Vb BL688 was an early example of the variant, having originally been ordered as a MkII. Delivered to the RAF in January 1942, it remained in service until a crash at Walmersley, Lancashire, on 29 May 1945 while in service with No 58 Operational Training Unit; quite a life-span. On the strength of No 501 Squadron, Free French pilot Cne Bernard Fuchs flew it to claim two kills, one each of a Bf 109 and Fw 190. Other notable assignments included a period with the US Army Air Forces' 335th Fighter Squadron at Debden, and those D-Day operations with US Navy cruiser scouting squadron VCS-7, among the most interesting aspects of wartime Spitfire/Seafire use. The recovered remains were the subject of a restoration started by the Parnall Group — successor to the company

Matt continues the restoration of the tail for Spitfire BS548.
JACK HOLT/ARCo

which built the likes of the Elf training and touring biplane between the wars — at Trelonk. ARCo provided some components to the project, before purchasing it in July 2022.

The current estimate is that BL688, now registered as G-LFVE, will probably be completed in two-and-a-half to three years. The FRXVIIIe, which returned to ARCo a few months after a landing mishap at Hildesheim, Germany, in May 2023, is anticipated to take a year-and-a-bit. The same sort of timescale is foreseen for the MkIXT, RK858/G-CGJE, a two-seat rebuild of a 1944-vintage ex-Soviet Air Force fighter. Its airframe first arrived at Duxford back in September 1992, owned then by The Fighter Collection following recovery from Russia. Having a third two-seater alongside PV202 and PT462 will help fulfil the demand for SSAC passenger flights experienced by ARCo's offshoot Aerial Collective Duxford, which, as we outlined in the March issue, is a substantial contributor to the company's wider activities.

Among those is the restoration of Firefly I DT989/G-CGYD, which will become Britain's first flying specimen of the Fairey carrier fighter and anti-submarine platform for many years. This one, which came to ARCo in 2004, spent the balance of its career with Swedish target-towing specialists Svensk Flygtjänst. "That is being worked all the time", says John. "When I finally manage each day to get out of the office, then I go onto that as well. I still like turning spanners. It's coming on really well. We're in the lucky position that we've got a spare engine for it. Those 'baby' Griffons are very much sought-after, not only for Fireflies but also for the early Seafires. People are always looking for them. We've got two, and they're very good engines, so putting an engine to it is not going to be a problem for us. It's going to sound fantastic. I would think it's about two-and-a-half years away."

Waiting in the wings is an aeroplane which offers more than a nod to John's beginnings in the business. Back in 1981, Morane-Saulnier MS505 Criquet G-BIRW was the first aircraft Graham Warner bought for his British Aerial Museum after the two Bolingbrokes — one of which became BAM's initial flying Blenheim — and a Chipmunk. The French-built Fieseler Storch was among John's earliest flying mounts, but it didn't stay long, Warner selling it to what was then the Museum of Flight at East Fortune a couple of years later. Fast forward to 2023, John says, "East Fortune decided it didn't fit their museum listings, and so they offered it back. It's in Building 66" — the workshop where John started out at Duxford back in the 1970s — "at the moment and we'll eventually get it flying again."

With so much work in progress, no wonder a planning application is under way to extend Building 425 further eastwards, "primarily for workshop space". It is hoped to start building this year. That hangar seemed very sizeable when it was first built to house the Lancaster, yet it rapidly filled up. But if there's confidence that clients will carry on bringing aeroplanes to ARCo's door, what about the new blood on the engineering side to restore and look after them? This has been one of the industry's challenges.

> ***"I believe our workforce is the youngest in the industry"***

"We're suffering at the moment", comments John, "with the lack of a college to send them to for their day school education. We started our own apprenticeships probably 20 years ago, and we were the first to do that. We did it completely in-house; the government said there was some funding, but fundamentally it was so difficult to get, and it's not that easy now, so we elected to go our own route. We had some great results from that, and a lot of the workforce here now have come from those various apprentice years. It stopped for a number of years, obviously, during the COVID cycle, but we reintegrated it again in 2022.

"We used Marshall Aerospace's programme called Aeropeople, but that's closed now, so we're currently looking at where we can send the next set of apprentices for all of their academic work. Normally what we would do is put them in for a year at Aeropeople, they'd do all the academic side and then they'd drop back into us for all the on-job training and

Being returned to flight for a client, Spitfire BS548 was active in wartime with Nos 340 and 341 (Free French) Squadrons, and is being painted in 340's colours with the codes GW-B. JACK HOLT/ARCo

the physical learning of all the trades — sheet metal work, wiring, instrumentation, fitting — with us here. At the end of the apprenticeship they'd move into the hangar floor, working as an engineer rather than as an apprentice.

"It has worked well and it still does work well. If you look at our workforce, I believe we've got the youngest age as an average in this industry. And they're a very important part of it. They work hard, they work well, they're very knowledgeable on what they're doing. Also, with the older people within the company, it's great that they pass their expertise down. We've got some wonderful people here who are nudging up against their retirements, and they want to pass the skill sets on. The youngsters are like sponges — they soak it all up."

That's something John knows well, given how he started as a Hawker Siddeley Dynamics apprentice in the 1970s, while also volunteering on historic aircraft at Duxford. And it's going to be crucial to the sustainment of the whole industry, every aspect of which depends on having a suitably skilled, trained and enthusiastic cadre of engineers. This is just one of the ways in which ARCo's aim is to be fit for the future, and, in so doing, ensure many more years of outstanding aeroplanes being put back into the skies.

To book a flight experience with Aerial Collective Duxford, visit www.aerialcollective.co.uk

OUT OF ANTARCTICA

It's not just historic aircraft on which ARCo performs maintenance. Many more contemporary ones are given attention too, perhaps the most prominent being the Falklands-registered de Havilland Canada DHC-6 Twin Otters of British Antarctic Survey. The scarlet twin-turboprops are regular seasonal visitors to the Duxford facility, and often perform lengthy flights over East Anglia to test new or upgraded items of mission equipment.

"We started helping British Antarctic Survey probably 15 years ago", says John Romain. "One of our pilots, Lee Proudfoot, flew for them — in fact he ended up being their chief pilot for a number of years. Their engineering team we also knew through looking after a Canberra [Ron Mitchell's TT18 WJ680]. Part of his engineering team was ex-air force and had worked on Canberras, and they left and went to work for British Antarctic Survey. We formulated a link with them. Initially we were overhauling things like ski jacks and that sort of work. The aircraft then were coming back into the UK for maintenance at Mann Aviation [at Fairoaks]. That ceased to happen and they started having most of their maintenance done in Canada, which they still do. But each year they normally send at least one aeroplane all the way back to the UK, which allows the scientists — who are based in Cambridge — to integrate new technology to the aeroplanes. We house the aeroplane here for the period. Of course, during our summer it's the winter down in Antarctica, so it then flies down for the Antarctic summer, which is when they operate there."

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STEVE SLATER

Hangar Talk

A vintage light aircraft aficionado's view on historic aviation

As you will no doubt have seen in the national press, Bicester has joined Old Sarum in having recently been affected by fires which have devastated aircraft hangars. In fact, hangar fires are not rare, but in these cases neither building contained any supplies of fuel or dope. In the case of Bicester, it was particularly terrible because three lives were lost: two firefighters and a sub-contractor.

Less noted by the media was a past airfield which suffered a significant hangar fire in March: the former RAF station at Desborough in Northamptonshire, where a hangar containing old carpets was consumed and burned for about a month, as local firefighters allowed it to burn out. An original Ministry of Aircraft Production type T2 hangar was destroyed and a huge smoke plume led to a request for residents of nearby villages to keep their windows and doors closed.

Floral tributes outside Bicester Motion following the terrible fire on 15 May, which claimed three lives. ALAMY

The conflagration at Bicester was in one of the 1920s 'expansion era' hangars on the site. It did not result in any aircraft being harmed, as the airfield owners had previously made the decision that no aircraft were to be based there. Now is not the time to discuss that. In any case, the aeroplanes were previously kept in the other of the two pre-war Type A hangars. That and the two wartime Type C hangars on the site, as well as many classic and vintage cars housed at the site, were unaffected.

Sadly, a vintage bus, the unique travelling cinema and (ironically) a vintage fire engine were all severely damaged in the blaze, as were some artefacts stored for a museum. As a former owner of a vintage aircraft based at Bicester, my heartfelt condolences go out to all those affected. At this early stage, the future of the hangar remains unknown.

> ***"Heartfelt condolences go out to those affected by the Bicester fire"***

A few weeks previously, an equally bad fire destroyed one of the three World War One-era hangars at Old Sarum in Wiltshire. The historic building, dating from 1917, had been allowed to fall into disrepair despite being listed as a site of special historical interest and being on Historic England's 'At Risk' register. It had not sheltered aircraft for some time. Fortunately, the Boscombe Down Aviation Collection and the collection of aircraft cockpits stored on site were not affected, but there was damage to items belonging to the skydive centre and the airfield café was destroyed.

The airfield owners had been told to make repairs to the hangar — which had already partially collapsed in January 2024 — as a condition of receiving planning approval. The blaze then came just a few weeks after a planning inspector ruled that Old Sarum Airfield, after a protracted battle with the council and local residents, has won its planning appeal and been granted planning permission for 315 houses and a new flying hub to be built on the 1917 aerodrome.

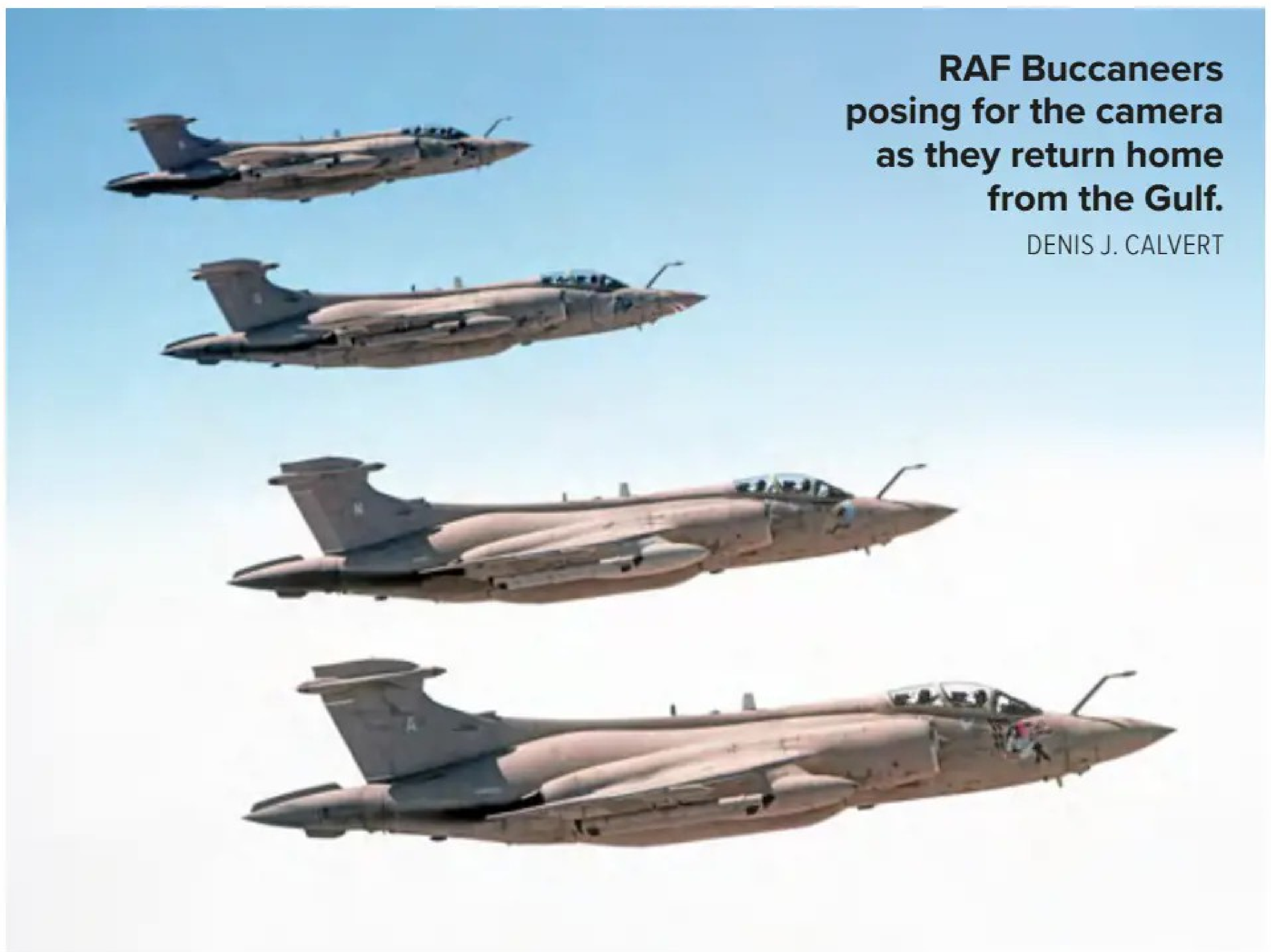
The Planning Inspectorate's decision followed an eight-day public inquiry and confirms that the aviation aspects of the development — the flying hub, hangars, parachute centre and heritage facilities — carry significant weight in planning terms, but the developers have yet to confirm whether general aviation activity and aircraft parking at the historic site will be able to resume. So, it remains to be seen whether Old Sarum can, literally and metaphorically, rise from the ashes.

DENIS J. CALVERT

FlightLine

Recollections and reflections — a seasoned reporter's take on aviation history

Last month I wrote on Operation 'Creek Party', which came about when the US Air Force found it had insufficient air-to-air refuelling tankers to meet demand when the unexpected happened — and especially when the unexpected happened simultaneously in two different parts of the world. The RAF had a similar experience in 1982 with the Falklands war, when its tanker force consisted of just two squadrons of ageing Victor K2s: 23 aircraft to span the 13,000km route from the UK via Ascension Island to the Falklands. Lessons learnt, the RAF subsequently accorded higher priority and funding to its tanker force.



RAF Buccaneers posing for the camera as they return home from the Gulf. DENIS J. CALVERT

When the Gulf War, Operation 'Granby', got under way in 1991, it was in a much better state. No 216 Squadron established a permanent detachment of two Tristar K1s at King Khalid International Airport in Riyadh, Saudi Arabia to provide tanker support to fighters flying combat air patrols over the desert. To give a degree of camouflage, these two tankers had been repainted in an overall desert sand colour at Marshalls of Cambridge. With a small RAF press party, I visited King Khalid and the various RAF detachments just after the end of the shooting war. This was a large, recently built airfield in the desert which had been partly taken over by the military — RAF, French and New Zealanders — with one large ramp and a terminal building being given over to RAF use.

On arrival at King Khalid, nobody saw or checked our documents, and we walked from our aircraft, past a line hut emblazoned 'Albert of Arabia: Lyneham Herc Det Gulf Tour 1991', through the terminal and straight out into the parking lot outside. Given that I'd very recently spent a day going up to London to visit the Saudi embassy for a visa, this was somewhat galling. Across the road was a US Patriot SAM battery, still very much on alert. Indeed, an RAF Tristar captain related how, weeks back, he'd had to hold at the end of the Riyadh runway while fragments of a Scud missile were cleared away after a successful interception. Two Tristar K1s were parked on the ramp, by this time in a somewhat worn 'desert pink' scheme. They had been christened by the groundcrews, ZD949 as *Pinky* and ZD950 as *Perky*, the latter carrying its name discreetly on the nosewheel door. Our party was in Riyadh on 15 March, which was 'Red Nose Day' back in the UK. Although this event is not widely celebrated in Saudi Arabia, the Tristars received bright red noses, dutifully painted by the groundcrew.

> ***"Facing a 12-hour flight, the 'Buccs' flew an immaculate four-ship"***

By this time, the return of forces to the UK and Germany was well under way. On 16 March we flew aboard Tristar KC1 ZD953 in a trail of three tankers. The 'trade' was 12 Tornado GR1s, each tanker accompanying four jets for two refuelling brackets en route. At the eastern end of the Mediterranean, the Tornados were handed over to other RAF tankers to continue their non-stop homeward-bound journey, after which our Tristar turned and returned to Riyadh to complete a seven-hour sortie.

A similar mission was flown the following day, when 12 Pave Spike-equipped Buccaneers were refuelled twice on their return home to Lossiemouth. Despite knowing they faced a 12-hour flight, the crews were more than co-operative and mounted an immaculate four-ship echelon formation on the port side of the tanker for the benefit of the camera. Thirty-four years on, should any of those Buccaneer pilots be reading this, thanks guys.

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From the Cockpit

RICHARD CROCKETT

Join one of Shuttleworth's newest pilots on his vintage flying journey

Every aircraft in the Shuttleworth Collection holds a place in the annals. Many of them aren't just part of history — they *are* history, with some, of course, being the sole surviving examples of their kind.

Among the roughly 40 aeroplanes owned by the collection, a select few are often regarded as the 'jewels in the crown,' machines of great historical importance due either to their achievements as a type or airframe, or the notable pilots who once flew them. Undoubtedly, one of the most significant of these is the Royal Aircraft Factory SE5a, F904/G-EBIA. This remarkable aircraft is the only airworthy, combat-veteran SE5a remaining from the First World War. It shot down a Fokker D.VII on 10 November 1918, just one day before the armistice, while being flown by Maj C. E. M. Pickthorn MC.

For any pilot who's given the privilege of flying a machine like this, the first challenge is setting aside the aircraft's past and focusing entirely on the job at hand. At first glance, the cockpit appears daunting. Alongside the standard flight controls, you are faced with a complex arrangement of fuel, air pressure and coolant systems. But once these are understood — and emergency procedures are second nature — it's time to take to the air.

Our man's first SE5a trip was a success and an unforgettable experience. DAREN EATON

And there the SE5a doesn't disappoint. Pilots who are familiar with the Tiger Moth will find this Great War fighter approachable in flight. However, the Wolseley Viper engine must be treated with great care. Throttle movements should be minimal to avoid a rich cut, making display flying best kept to solo performances or very loose formations. While once fully aerobatic, this 108-year-old airframe must now be flown with the utmost respect, ensuring the display is conservative and fully befitting the aircraft's age and great historical value.

Landing the SE5a presents its own distinct set of challenges. A direct into-wind approach is essential; even a slight crosswind during the flare can lead to a wing drop and a ground-loop. The undercarriage uses only basic bungee suspension, making it prone to bouncing between the mainwheels and tailskid which, if it's not dealt with promptly, can cause serious damage.

> *"This 108-year-old airframe must be flown with the utmost respect"*

On the ground, taxiing is relatively straightforward thanks to the steerable skid, but constant attention must be paid to engine temperature. The radiator shutters assist with cooling, but in hot weather, thermal runaway is a real risk and can cause substantial damage to the engine.

The SE5a is my first experience of flying a World War One aircraft, and while it's easy to judge it by modern standards, I find it genuinely impressive. True, it demands more monitoring than a modern type, but it offers multiple redundancies for delivering fuel in case of system failure or battle damage. The coolant system needs management, but overall the aircraft is mechanically simple and reliable. Most importantly, if a problem arises, the safest thing is to land rather than troubleshoot in the air.

As a combat aircraft, the SE5a was revolutionary. It set a benchmark for what a fighter should be: easy to fly and highly effective in battle. It's no wonder many refer to it as the Spitfire of the First World War.

In terms of historical importance, I'd argue F904 isn't just one of the crown jewels of the Shuttleworth Collection — it's among the most significant aircraft still airworthy anywhere in the world. And to be entrusted with flying it? Calling it an honour barely begins to capture the experience.

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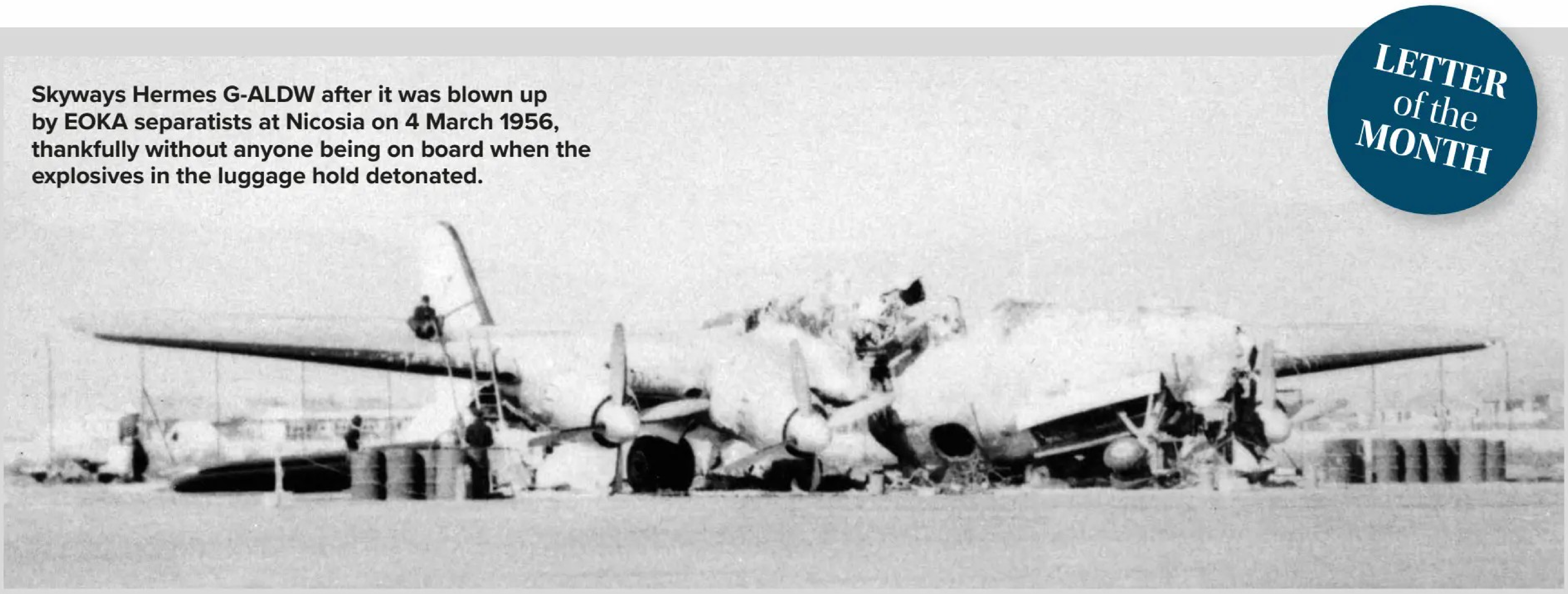
LETTER of the MONTH



Skyways Hermes G-ALDW after it was blown up by EOKA separatists at Nicosia on 4 March 1956, thankfully without anyone being on board when the explosives in the luggage hold detonated.

What a great article in the May issue on the Duxford Aviation Society. Now in my 90s, having worked with aircraft for 44 years from the 1950s to the '90s and been involved with so many of the types pictured, one of them, Handley Page Hermes G-ALDG, brings memories to mind.

My first meeting with the type was during my RAF national service, as my flight to Cyprus via Malta was in a Britavia Hermes, out of Blackbushe in 1955. I recall this ex-BOAC machine had a series of small rubber-bladed fans located on the then open luggage racks for ground air conditioning! Then one day, while serving at Nicosia, from our pan we watched a trooping flight Hermes flying low over the Kyrenia mountain range trying to shake its nose undercarriage leg down. Later we heard the flight engineer had cut a hole in the flight deck floor to release the leg. I was told some very sick passengers deplaned, not surprisingly.

The next event was that of a Hermes being blown up outside the main terminal by EOKA terrorists [G-ALDW of Skyways, on 4 March 1956 — Ed]. A couple of us drove down to the pan to see the results of what remained while it was being defueled, as shown in the photo above.

In 1959 I was working at Gatwick with Transair when it was formed into British United Airways and we were presented with three Silver City Hermes, one of which was G-ALDG. As an electrical licenced chargehand I had a few memorable ground running experiences at the time. I recall the main power system was one of the early 208-volt frequency wild type, with only two 208-volt AC alternators and a 28-volt DC generator as a back-up. I had thoughts of getting my licence on the type when my chief engineer said, "Don't bother, lad. They are going shortly."

One vivid memory is of being in the cockpit as co-driver on a tow up to the hangar when the towbar detached from the tractor, and there was a major braking need as we swung on the perimeter track. With the tractor needing to be reconnected and no steps, we had to slide down the knotted escape rope, which hurt my hands.

After the other aircraft departed for good, 'DG was moved around the side of the hangar and broken down in the car park while we watched. The fuselage was taken to the front of the buildings to be used for cabin training. Two of my fitters got overtime to fit it out with 230-volt mains power and cabin fluorescent lighting. I went into the cockpit and was surprised to see all the instruments and autopilot still intact.

Having moved on in life I never thought I would be in a Hermes again, but a couple of years ago I was delighted to be reunited with 'DG again, in very good condition at Duxford.

Pat Pearce

The vintage sailplanes article in the June issue strengthened my feeling that *Aeroplane* is my favourite aviation magazine: it is versatile. I started to read *Aeroplane* as a young boy when I was in elementary school. My linguistic qualifications were rather limited, but with the support of a dictionary I somehow managed: *Aeroplane* was an excellent language school.

It was the piece on vintage sailplanes that brought this memory back. I started to fly gliders in 1961, and during 1963 I flew a fine specimen of one of the aeroplanes shown in a picture in the article: the Olympia. To fly this type was great. After the Olympic Games in Berlin in 1936, it was decided that gliding should be an Olympic event in Finland in 1940. Because of the war — and, after the war, probably due to antipathy towards the people who made the decision — it never materialised.

According to the original rules all participants were to fly identical aeroplanes. After an international competition, a design from DFS (the Deutsche Forschungsanstalt für Segelflug) won. But this glider, named the Olympia, was produced in many countries. The one I flew, LN-GAV, was originally built by Schleicher in Germany in 1939 for Swedish participation in the Olympics as SE-SAF. It was sold to the Oslo Flying Club in Norway in 1959 and crashed in 1964.

Back to *Aeroplane*: I like the magazine because it passes on information about both military and civilian aviation, covering a

Tor Richvoldsen with the Olympia he flew in 1963 — a very historic specimen, sadly no longer extant.

great time-span. And it says how it was to fly these aeroplanes.

Tor Richvoldsen

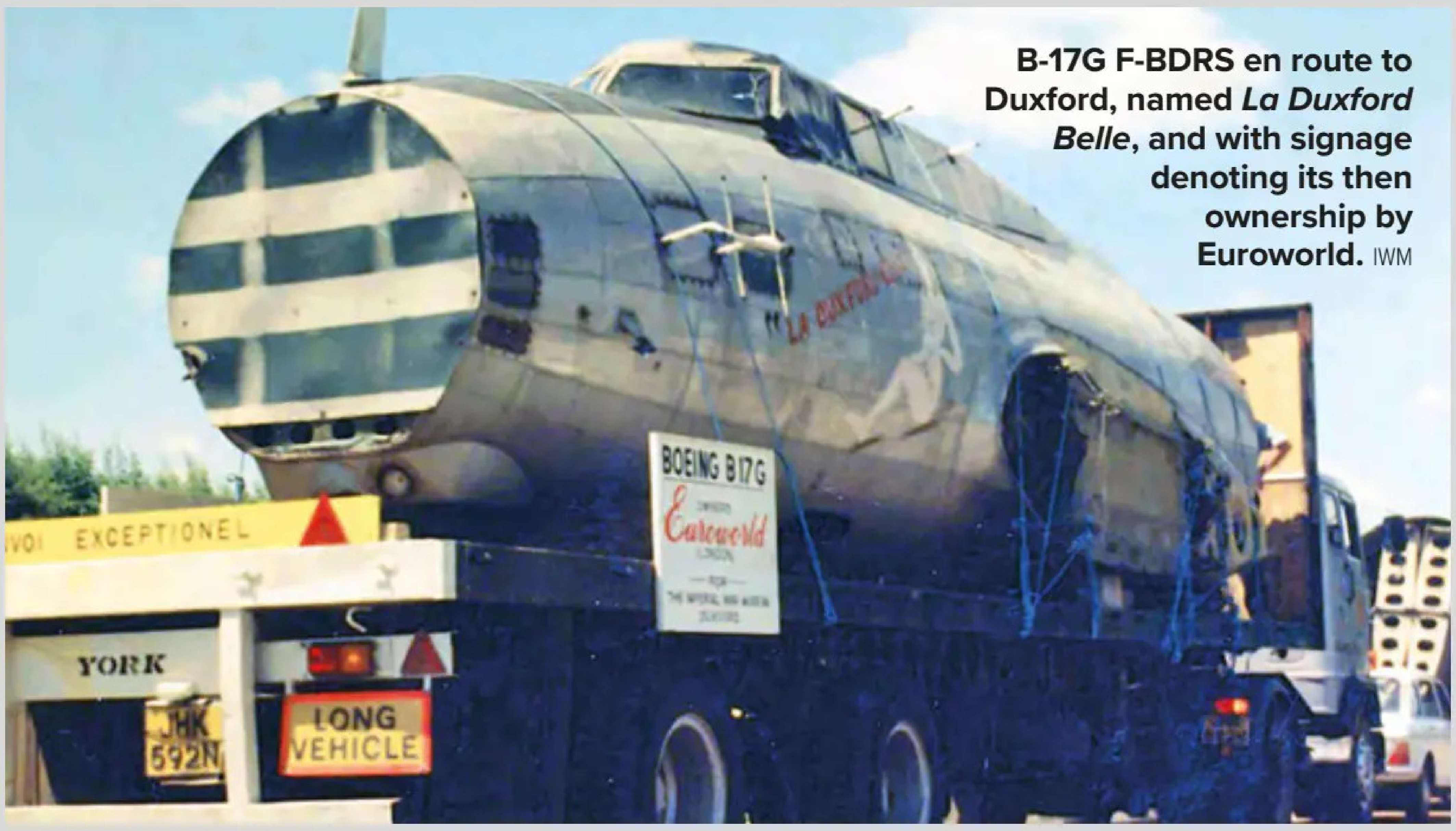
On 25 May my wife and I paid a long-overdue visit to the Aviation Heritage Museum in the Perth suburb of Bull Creek for the celebrations of its Lancaster, NX622, on its 80th birthday. NX622 was built in May 1945 at Longbridge and, of course, never saw wartime service. During 1951 it was converted to the maritime role for the French Navy, as serial WU-16, in New Caledonia. The French operated it until 1962 when a deal was done to sell it to the RAAF Association here. It arrived at Perth airport on 1 December 1962 after a three-day ferry from Nouméa via Sydney and Adelaide. The aircraft stayed parked at Perth until it was disassembled and taken by low-loaders to the museum on 18 August 1979.

We had a wonderful day with a celebratory sausage sizzle and an enormous birthday cake — very enjoyable. Since we were last there, the museum has acquired an ex-RAF Tornado GR4 and an ex-RAAF F/A-18 to add to its collection of 25 aircraft.

Reading my May copy of *Aeroplane*, I am very disappointed at the attitude of the RAF Museum and its statement about policy and collections. Those who decide on all these disposals must have no idea or appreciation of how much joy aviation enthusiasts have in seeing the Varsity, Andover, Argosy, Devon and Pembroke. Last year we were visiting family and friends in England and Northern Ireland and had a day at Cosford — we hadn't been since way back in 1987. Disposing of Comet 1 G-APAS is a tragedy and we hope some organisation will find a home for it. As for Duxford, which we have visited recently too, it is absolutely wrong for the IWM to have decided to push the York outside. Enough said.

Merv Crowe

Lancaster VII NX622 at Bull Creek on the occasion of its 80th anniversary.



B-17G F-BDRS en route to Duxford, named *La Duxford Belle*, and with signage denoting its then ownership by Euroworld. IWM

Having just read the article on B-17 *Sally B* in June's edition, it brought back some memories of my time with the Duxford Aviation Society in 1976-77. I had joined DAS as a volunteer and was part of a team reassembling the other B-17, F-BDRS, otherwise known as *La Duxford Belle*. I would normally be there on a Tuesday evening, and we also worked on the aircraft at weekends. All was progressing well, and we had the undercarriage lowered and were busy getting the outer wings ready for reattachment. Around May 1977 we had a visit by a couple of people who had asked when the aircraft was going to fly. Our team leader said it was a static restoration, with no plans to make it airworthy. This prompted the reply that they represented the aircraft's owners, and that it was to be restored to flight status, after which it would be leaving for the USA. Were they from Euroworld? We didn't find out.

Being concerned that we were going to see our project disappear after all our endeavours, we stopped work and there followed a series of meetings with the IWM where we tried to get clarity on the project's future. As F-BDRS was still owned by Euroworld at that stage, of course it was theirs to do with as they wished. So, with work at a stop and an uncertain future, our team gradually scattered. After a short time doing some rectification work on *Sally B* as it was in maintenance at the time, I too left the project and DAS, although I did return to Duxford to assist with airshows as an IWM volunteer later on. Little did I know that in 2005 I would return again to work with The Fighter Collection until my retirement in 2018!

Greg Baddeley

I recently decided the June edition of *Aeroplane* would be my principal reading on a 10-day break to join my daughter and grandchildren in Vietnam to celebrate my 80th birthday. When it arrived by post, glancing through it at the less meaty articles — mustn't spoil a determined read — I noticed Phil Catton's letter on the distance readers have taken their own copies.

Using the high technology of a globe and a tape-measure, I estimate the total route distance via Singapore for the return journey will be around 17,250 statute miles. I'm sure this can, and will, be topped.

Interestingly, over the 10 days, this equates to an average ground speed of 72mph. Thank goodness for modern airliners, and for the magazines that look back at the way things used to be done, often equally astounding to us in 2025!

Rod Joyce

I was intrigued by the letter in the June edition of *Aeroplane* about travelling copies of the magazine. I live in Adelaide, Australia so all the copies of *Aeroplane* I've bought in the past 40 years have travelled 10,000 miles before I even start reading them. Some years ago, I took the regular aviation museums insert with me to the UK on a holiday, so that part of the magazine travelled a further 20,000 miles — and was very useful.

Danny Warren

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Q&A

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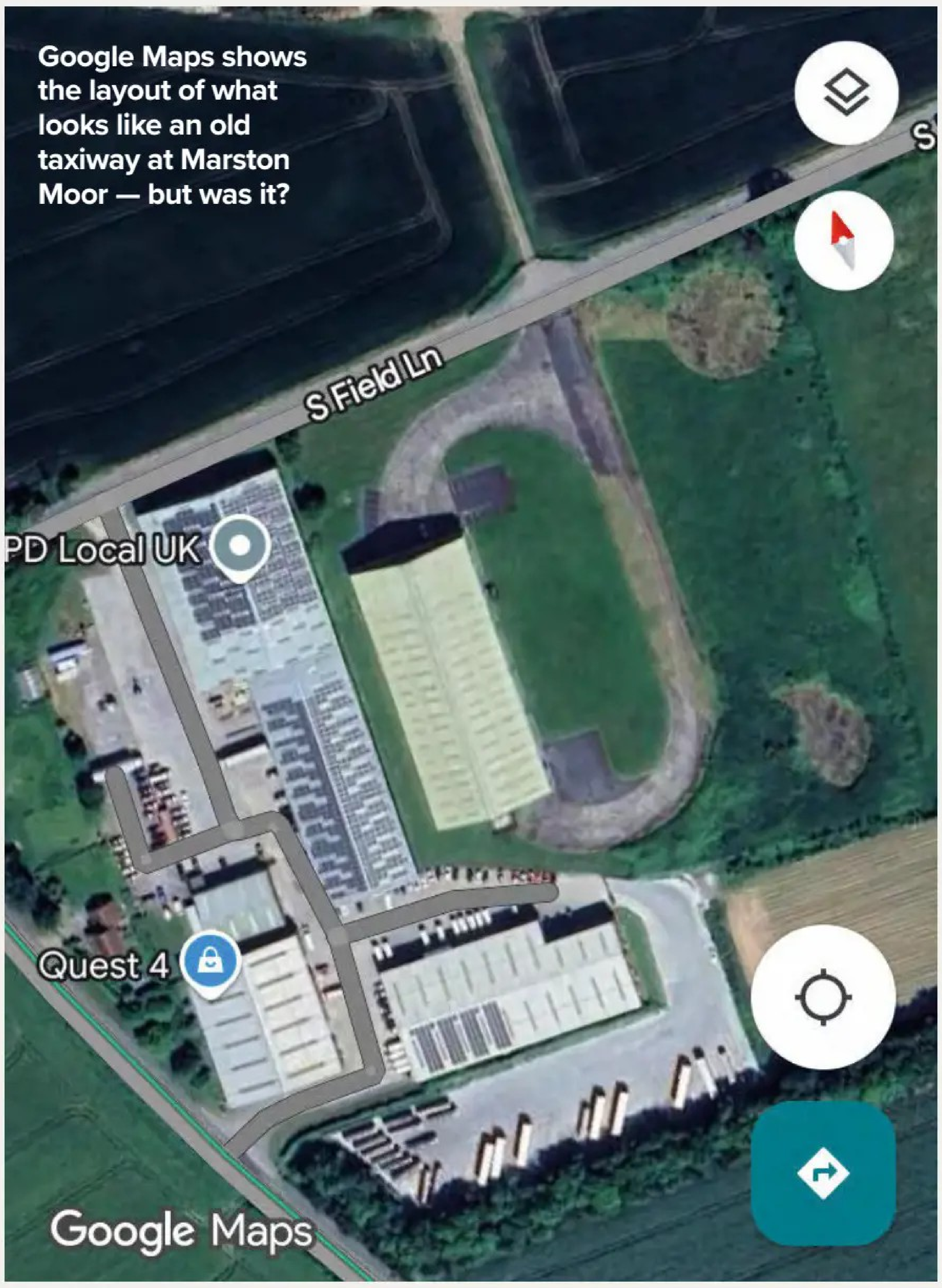
Are you seeking the answer to a thorny aviation question, or trying to trace an old aviation friend? Our 'questions and answers' page might help

THIS MONTH'S QUESTIONS



Google Maps shows the layout of what looks like an old taxiway at Marston Moor — but was it?

Marston Moor layout

Q David Dickinson is trying to identify a concrete oval at RAF Marston Moor (Tockwith) near Wetherby, Yorkshire. If anyone can provide a clue as to its role, when it was built and what it was used for when the airfield was active, David would like to hear from you.

MU details wanted

Q Martin White is seeking details on No 71 Maintenance Unit where his father served between August 1940 and February 1942. From information he has gleaned from his brief discussions on the subject, he believes it was based at or near the Premier Garage on the A4 road at Slough. If so, any photos or details on the work of this MU would be appreciated.

Heartbeat Hurricane

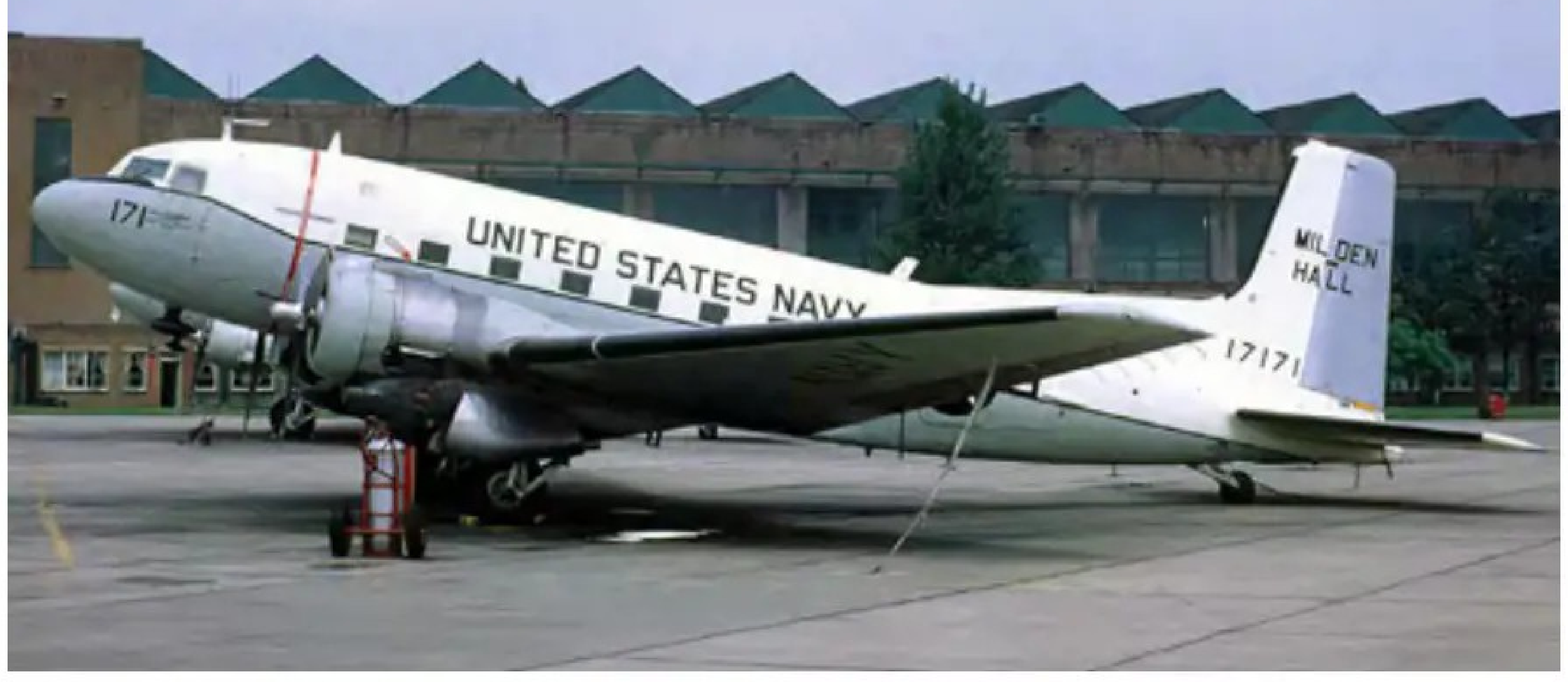
Q Geoff Dobson wonders if anyone can identify the Hurricane which made an appearance in an edition of the ITV programme *Heartbeat*. He would like to know the actual registration and/or the serial if possible.

A Tiger for Metheringham?

Q Rod Sanders of the Metheringham Airfield Visitor Centre is looking for a suitable aircraft for display there. While a Lancaster would be the "ultimate choice", it's currently out of the question, so Rod and his team have set their hearts on a DH Tiger Moth which equipped the wartime Station Flight. If anyone is wishing to dispose of a suitable example or has some Tiger parts, they would gladly take them. Contact sdreadnought@aol.com.

THIS MONTH'S ANSWERS

C-117D BuNo 17171 stationed with the Naval Air Facility at Mildenhall in 1968. ADRIAN M. BALCH



'Super Dak' at Aberdeen

Q Items in the May and June issues concerned the identity of a US Navy 'Super Dak' which visited Aberdeen in the late 1960s.

A Keith Bryers recalls C-117D BuNo 17116 being a regular visitor to airfields in Scotland, including Dyce. It made weekly supply flights for the US Navy signals intelligence base at Edzell and to Machrihanish for the Naval Aviation Weapons Facility in 1972-73, but he has no recollection of any accompanying Beaver. The C-117 was based at Mildenhall between 1971 and 1973. While working at Belfast airport in 1966-70, Merv Crowe remembers regular visits by USN and USAF C-47s and C-117Ds, one of the latter being 17171. He doesn't recall 19191 and wonders if that number could have been misread; certainly 17191 was also Mildenhall-based.

Gatwick's post-war strangers

Q Discussion of some rare Gatwick residents began in the January edition.

A Keith Palmer reminds readers that a book by Peter Amos and Brian Buss, *History of Southern Aircraft (Gatwick) Limited* confirms a GAL55 came to Gatwick, J. E. Coxon bringing second prototype NP674 when it was put up for tender, believing the aircraft might be of use by his Air Training Corps unit, No 1810 Squadron. However, there is no mention of the AJ Walter company in the book, nor of the Miles M64/LR5.

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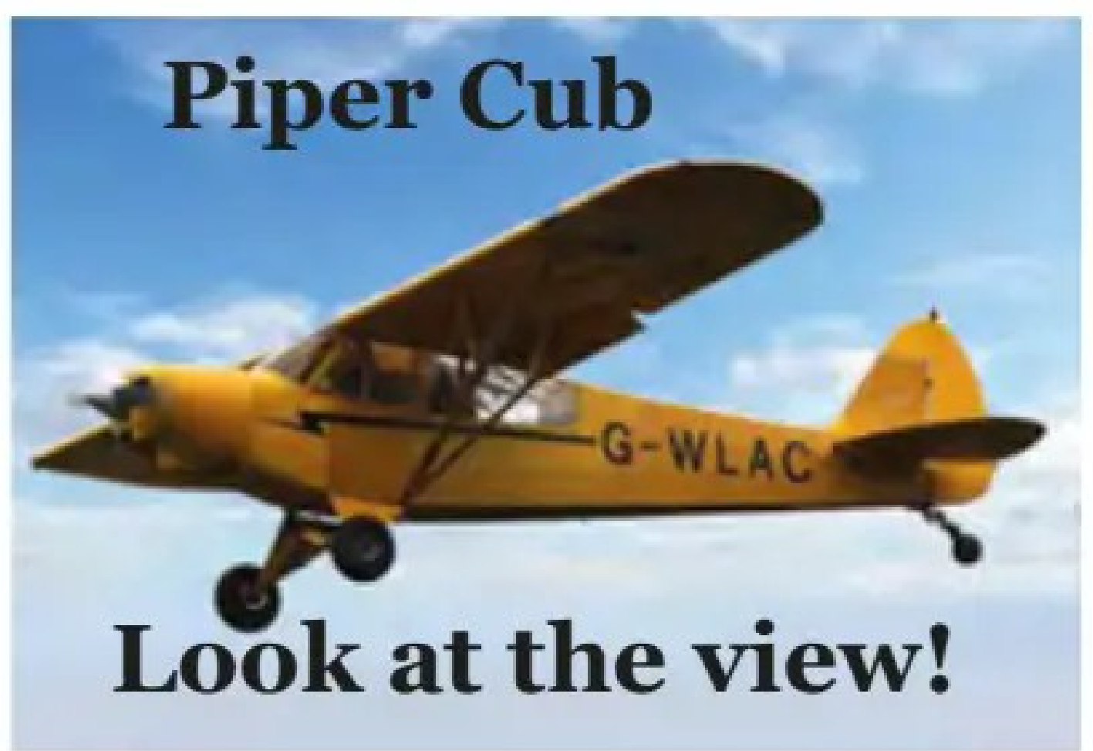
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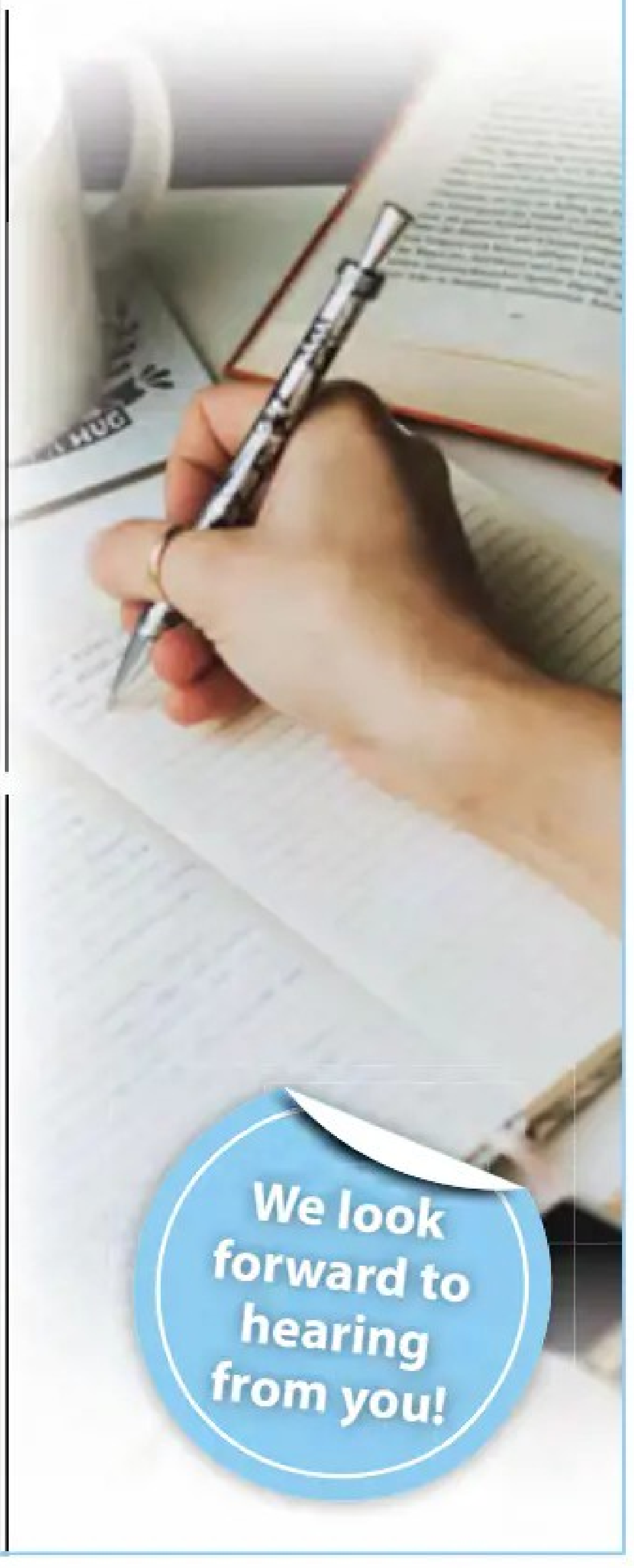
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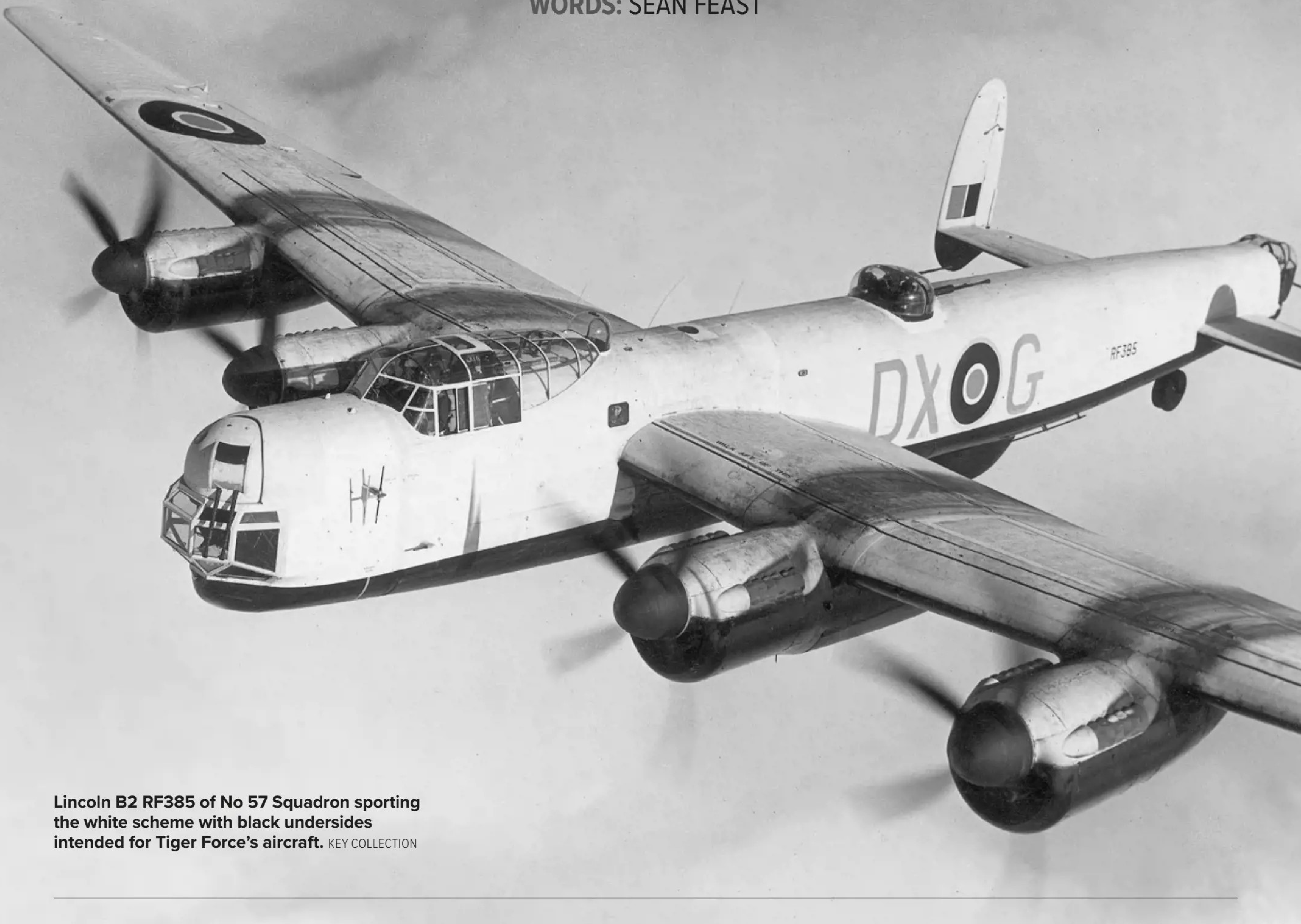
PAPER TIGER

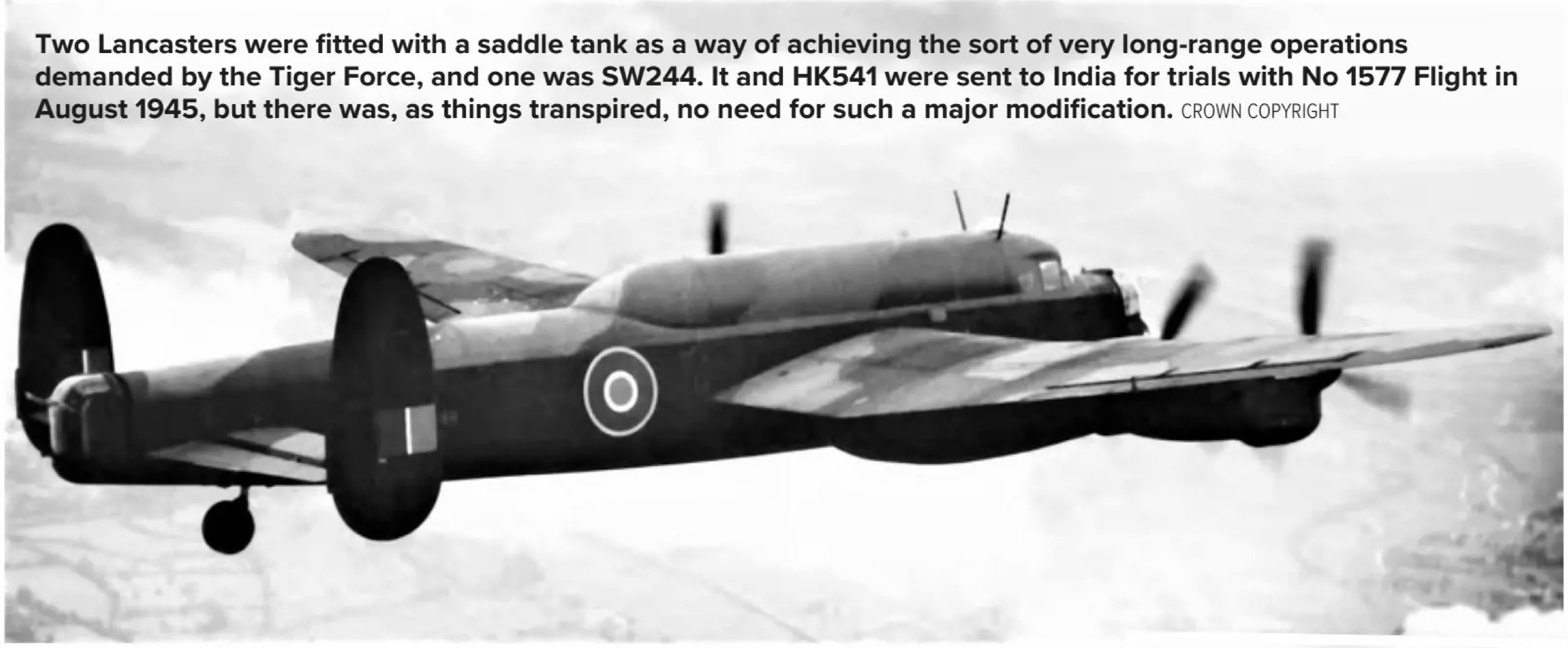
The RAF's Tiger Force looked good on paper, and was a masterclass in agile planning, but would the results have been worth the effort if the Pacific War hadn't been ended by the atom bombs?

WORDS: SEAN FEAST



Lincoln B2 RF385 of No 57 Squadron sporting the white scheme with black undersides intended for Tiger Force's aircraft. KEY COLLECTION

Two Lancasters were fitted with a saddle tank as a way of achieving the sort of very long-range operations demanded by the Tiger Force, and one was SW244. It and HK541 were sent to India for trials with No 1577 Flight in August 1945, but there was, as things transpired, no need for such a major modification. CROWN COPYRIGHT



As far back as the winter of 1943, the RAF had given thought to how it might support its American allies in the bombing of Japan. It was an idea that found its champion in the Prime Minister, Winston Churchill, who raised the issue at a conference in Quebec in September 1944. He stressed, "the vital importance that the British should participate in the direct air attack on Japan."

Churchill's rationale was simple. The US had contributed handsomely to the imminent defeat of Germany; it was only right and proper that the RAF should return the favour and assist the Americans in the defeat of Japan. Before the RAF could lend its full weight to the Japanese project, however, it must first focus on concluding Phase I — the European war. Only then could it rightfully turn its attention to Phase II.

On 27 October 1944, the US chiefs of staff accepted an offer in outline from the British to send a bomber force of around 40 squadrons of Lancasters, half of which would be in-flight refuelling aircraft in anticipation of the huge distances that needed to be travelled in bombing the Japanese mainland. Indeed, the issue of where the Lancasters were to be based became something of a moving target that plagued the force throughout its gestation.

It was a month later, on 23 November, that the first formal administrative plan was produced by the Air Ministry and given the uninspiring title — it was actually described as "depressing" in the official despatch — of Operation 'Mould'. The outline plan in essence divided the future very long-range (VLR) bomber force into three groups, each of 12 heavy bomber and six long-range fighter squadrons. The groups would be taken from the UK, Canada, and air and groundcrew already serving in south-east Asia. The first priority, once Germany was defeated, would be given to preparing the UK group.

Renamed more imaginatively 'Tiger Force' on 24 February 1945, the authorities chose as its leader Air Marshal Sir Hugh Lloyd who had achieved huge fame and admiration for his command in the defence of Malta. More recently he had led the Mediterranean Coastal Air Force and had a spell back in Britain at Bomber Command headquarters to bring himself up to date with the latest bombing tactics and techniques and discuss the many and varied problems connected with his new brief.

Almost immediately there were problems. The RAF's involvement was subject to the availability of suitable bases, and it was subsequently determined by Gen Kuter, the US assistant chief of staff, logistic planning, that the Americans could not be relied upon to supply or build the British a base at all, and that Tiger Force should be able to develop its own bases "from tidewater to aircraft". Kuter was by no means being obstructive; quite the opposite, but he was spinning a lot of plates and there were many calls upon his time and resources. Gen Henry 'Hap' Arnold, the commander of the US Army Air Forces, took the view that the VLR force should be "self-supporting to the maximum possible extent."

Lloyd's despatch provides the full context of the task in hand: "It meant the mounting of the VLR force onto a base over 14,000 sea miles from this country entirely self-supporting from the ships in which it travelled to the aircraft in which it flew. The force had to be capable of providing all its own resources including the requirements of

> *"The Americans could not be relied upon to supply or build a base"*

ABOVE: As an air marshal, ACM Sir Hugh Lloyd, as he is here, was the Tiger Force commander. ALAMY

ABOVE: No 35 Squadron Lancaster BI(FE)s set for participation in the 1946 Operation 'Lancaster' goodwill visit to the USA on a test flight over the English coast. The FE in this variant's designation stood for Far East, it incorporating certain modifications including additional fuel tankage.
KEY COLLECTION

port operating, port construction, building of roads, airfields and communications, laying petrol farms and pipelines, provision of material such as hard core, erection of hutting etc and the unloading of shipping at an unknown port. In addition, a suitable backing had to be organised such as had been provided to Bomber Command by Maintenance Command, civil repair organisations, and aircraft and accessory manufacturers etc."

Somewhat alarmed by the meandering nature of his command, Lloyd travelled to Washington on 1 March 1945, the first of several trips back and forth to the capital to determine to what extent they could rely on US logistical support. The fluidity of the war in the Pacific meant different bases were being proposed at different times, among them Guam, Saipan, and Tinian in the Marianas, though they were hopeful that Luzon too would soon be available once captured from the Japanese. Certain islands in the Ryukyu were also mentioned but information regarding their suitability was unreliable, adding a further tier of complexity to Lloyd's planning.

In the end they settled upon northern Luzon as being the only base available and by the end of March, Lloyd was content he knew where they stood: they had a base, but needed to provide the logistical support, and they had — in Churchill's words — a "seat in the stalls" but no idea how much that seat may ultimately cost.

◆

The Canadians, Australians and New Zealanders were all willing partners in the enterprise although each had their individual challenges. The Australians were especially keen, given that many of their Bomber Command aircrew had returned home to unfair, unwarranted and hurtful accusations of being 'Jap-dodgers'. The Cagayan Valley in northern Luzon would be the base for a force of 20 heavy bomber squadrons, eight Canadian and 12 RAF, one Pathfinder Mosquito squadron, one PRU/met squadron and one air-sea rescue squadron, all of 20 aircraft each. The US acceptance to provide air defence negated the need for further Allied fighter squadrons.

To construct the base would require approximately 106,000 men, of which the RAF would contribute 71,500 comprising 50,000 squadron and maintenance personnel and 21,500 construction and administrative personnel. The army would provide 14,300 men with an additional commitment to a further 20,000 during the construction period. The immensity of the task is evidenced by its estimated duration. All things being equal, the first base, constructed from scratch, would be available from 1 February 1946.

A meeting of the combined chiefs of staff on 19 April threatened to derail the scheme altogether. The Chief of the Imperial General Staff (CIGS) did not consider that his military was committed to sending a VLR force to the Pacific, or whether the results such a force could achieve would justify the interference with other operations. It might not, in his view, "have any appreciative effect on the war against Japan". The Chief of the Naval Staff also chipped in, concerned that diverting engineers away from building bases for his Fleet Air Arm aircraft could ultimately lead to the withdrawal of the British Pacific Fleet if he could not guarantee their protection.

The game changed again with the planned assault on Miyako. From Luzon, Lancasters would be limited in their bomb loads and targets, owing to the distances involved. These distances, in some cases,

ABOVE: **Lancaster VII(FE) NX612 ended up with No 1689 (Ferry Pilot Training) Flight once plans for Tiger Force had been canned. This aircraft is, of course, just one serial number away from the Lincolnshire Aviation Heritage Centre's famous *Just Jane*, NX611, in which you can taxi at East Kirkby — and which was also intended for Tiger Force. So too was PA474, now with the Battle of Britain Memorial Flight.**
KEY COLLECTION

would be almost halved if operating from Miyako — the distance from Luzon to Nagasaki, for example, was 1,010nm; from Miyako it was only 543. Returning from another meeting in Washington on 20 April, Lloyd recommended making a bid for Miyako, hoping the 2,500 RAF airfield engineers who could be deployed within weeks of a call would be sufficient to see his request succeed. The shortage of engineers, as well as a paucity of men with other skills who were sorely needed across multiple theatres of war, threatened to relegate Tiger Force to a mere sideshow. Lloyd said as much in his summary for the period March-April 1945: "The future of Tiger Force did not look very promising."

At a chiefs of staff meeting on 1 May 1945, it was decided to try and force the Americans' hands by sending the 2,500 RAF airfield engineers to the Pacific regardless and informing their allies a further 5,000 could shortly be on their way. The initial party would sail under a convoy designated 'Shield'. They had nothing to lose in despatching them, and it could sway the balance. Finding sufficient ships, however, was a challenge.

The decision by the Americans not to take Miyako moved the goalposts for a third time in quick succession, and Okinawa came into view where the prospects of developing airfields "were better than had been anticipated". Victory in Europe on 8 May also brought Phase I to a conclusion, though any prospect of an immediate focus on Phase II was unlikely. The switch, Lloyd wrote, was not "like turning over a pancake"!

> *"The British chiefs agreed to the force coming under US control"*

Now headquartered in Bushy Park, Lloyd expanded his staff to meet the new urgency being placed upon him. The Americans were keen that the British should take advantage of Okinawa as their proposed base but were concerned the 2,500 RAF engineers fell well below the 15,000 constructional troops they believed would be needed and could not — at that time — commit their own personnel to the task. Lloyd discussed the problem further with the deputy commander of the Army Air Forces, Gen Ira Eaker, but he could offer little in the way of practical support. He also made it clear that unless and until Tiger Force could be more certain in the logistical support it could provide, he would restrict the RAF's involvement to only two squadrons in December and two more in February 1946.

Things came to a head at the end of May and beginning of June when the US chiefs of staff made a formal offer of Okinawa, the largest of the Ryukyu islands. It read, "in order to make the most timely and profitable use of the British land based air power against Japan, the United States propose a British force of the order of 10 squadrons of some 220 aircraft to be based in the Ryukyu. We assume this force will come under United States command."

On 4 June the British chiefs gladly accepted the offer from their American counterparts, and agreed to the force coming under US control. It was understood the British contingent would be sharing a base with the Americans, and that it would therefore contribute to "their fair share of logistic and engineer requirements". What

RIGHT: The 12,000lb Tallboy deep-penetration bomb would have been the Tiger Force's main weapon. This one is being removed from the weapons dump at Woodhall Spa for a No 617 Squadron raid on the Wizernes V2 site. CROWN COPYRIGHT

would happen to the remaining 10 squadrons was, for the time being, left undecided.

Churchill was delighted and dashed off a signal to Gen Marshall in which he thanked him for his very handsome gesture: "Our contribution will help though nothing like what we should like to give you in your tremendous effort to crush Japan speedily."

Second-guessing their allies, orders were given for the 'Shield' convoy to set sail, even though its ultimate destination was still to be decided. The first ships slipped anchor from Liverpool on 20 June. Speed was of the essence, and it was assumed that by the time the convoy had reached the Panama Canal, its final port of call would have been communicated. The convoy comprised 3,000 personnel, 15,000 tons of airfield construction materials and stores with some 522 vehicles, not including trailers and motorcycles.

Interestingly, morale among the troops wasn't especially high. On visiting the convoy prior to its sailing, Lloyd observed a lack of enthusiasm: "All war interest had been lost with the end of the German war; the Japanese war was too remote for them". Feelings were certainly mixed. No 467 Squadron's operations record book noted its crews were "all very unsettled and now anxiously awaiting the composition of the squadron". A week later, on 28 May, things were much happier: "The squadron personnel selected for the Far East theatre were announced today and all now know exactly whether or not they are proceeding."

Some of the Bomber Command aircrew were more eager than others to have a go at a new enemy, and genuinely disappointed if their names weren't on the team sheet. Reg Davey, a navigator with No 627 Squadron, was not one of them: "I recall that we were to be based on Okinawa and, when on hurriedly scouring a map of the Far East we discovered that this was a small island to the south of Japan, which would entail round trips of some 1,600 miles in Mosquitoes, mostly over the ocean, we were not terribly thrilled!"

As the ground preparations got under way, so did preparations for the air contingent. No 5 Group, under the command of AVM Hugh Constantine, was intended to be the first group deployed as part of Tiger Force. It was to comprise Nos 83, 97, 106, 467 (RAAF) and 627 Squadrons in the first party, and Nos 44, 57, 207 and 460 (RAAF) Squadrons in the second, all designated Tiger Force 'Hurst'. Each squadron was to have 20 aircraft with 25 crews and a maintenance wing would proceed with each party: No 242 Wing at Woodhall Spa and No 243 Wing at Stubby. The second contingent, 'Peace', was to be made up of eight Lancaster squadrons of No 6 Group, RCAF and be readied in Canada.
To ensure the force was fully Commonwealth in status, No 75 Squadron, RNZAF was transferred from Mepal and No 3 Group to Spilsby in Lincolnshire to replace No 44 Squadron. A third contingent was also ordered.

> ***"Some of the aircrew were more eager to have a go at the new enemy"***

With the pace of deployment accelerating, Lloyd arrived in Guam on 8 July to be greeted by Adm Chester Nimitz, the commander-in-chief Pacific Ocean Area, whose first intimation of the RAF's intended participation in the air war in Japan had been heralded by news that a convoy was already on its way. It was not, as Lloyd recounts, a propitious start, but Nimitz and his staff were more than accommodating. Okinawa had now been confirmed as the convoy's final destination allowing a second, 'Vacuum', to begin loading. Responsibility for the construction of the new airfield at Okinawa was given to Cdre Bissett, to whom all British construction troops would henceforth report.

Lloyd returned to Washington on 19 July to find the AAF delighted with the progress that had been made. Here he met with Gen Carl 'Tooey' Spaatz, now commanding general of the Strategic Air Forces in the Pacific, who asked for two 'Tallboy' squadrons to be operational on Okinawa by 15 October. The fame the Barnes Wallis-inspired 'earthquake' bombs had achieved in penetrating U-boat pens and destroying railway viaducts in showpiece raids had clearly impressed the Americans, and they wanted them in their armoury. A planned assault on Kyushu, Operation 'Olympic', would require the destruction of several large-span road and rail bridges between Tokyo and Shimonoseki, and the tunnel connecting the town with the island, and Spaatz believed a number of well-placed 12,000lb bombs would do very nicely.

While Lloyd was away, 'Hap' Arnold was quoted — somewhat unhelpfully and not with Lloyd's approval — in the London *Times*: "The Combined Chiefs of Staff intend to use British air forces, including the RAAF, to the maximum against Japan. We plan during 1946 to drop thrice as many bombs on Japan as we dropped on Germany. They will be dropped in an area one tenth the size of Germany. Our plans call for the dropping of 2,000,000 tonnes including the British contribution."

Tiger Force was now ready to be born. Even the failure of the Canadians to provide a promised 2,500 engineers to bolster the British effort was described merely as unfortunate rather than consequential, and immediate arrangements were put in hand to prepare Nos 9 and 617 Squadrons for their new role as Tallboy squadrons in the Far East. The size of the bombs, and the special equipment needed to handle them, obliged the authorities to charter a special fast ship, *The Chinese Prince*, to be ready to sail on 25 August.

The composition of RAF bomber squadrons destined for the Far East changed many times. By the end of July it stood as follows: No 551 Wing comprising Nos 9 and 617 Squadrons; No 552 Wing comprising Nos 106 and 467 (RAAF) Squadrons; No 553 Wing comprising Nos 83, 97 and 627 Squadrons (the latter with Mosquito B35s); No 554 Wing comprising Nos 75 (RNZAF) and 207 Squadrons; and No 661 Wing comprising Nos 419 (RCAF) and 428 (RCAF) Squadrons. Since only 10 were to be deployed in the first phase, No 207 Squadron was expected to deploy at a later date. The force included 20 Mosquito PR34s from No 544 Squadron for photo-recce and meteorological purposes.

◆

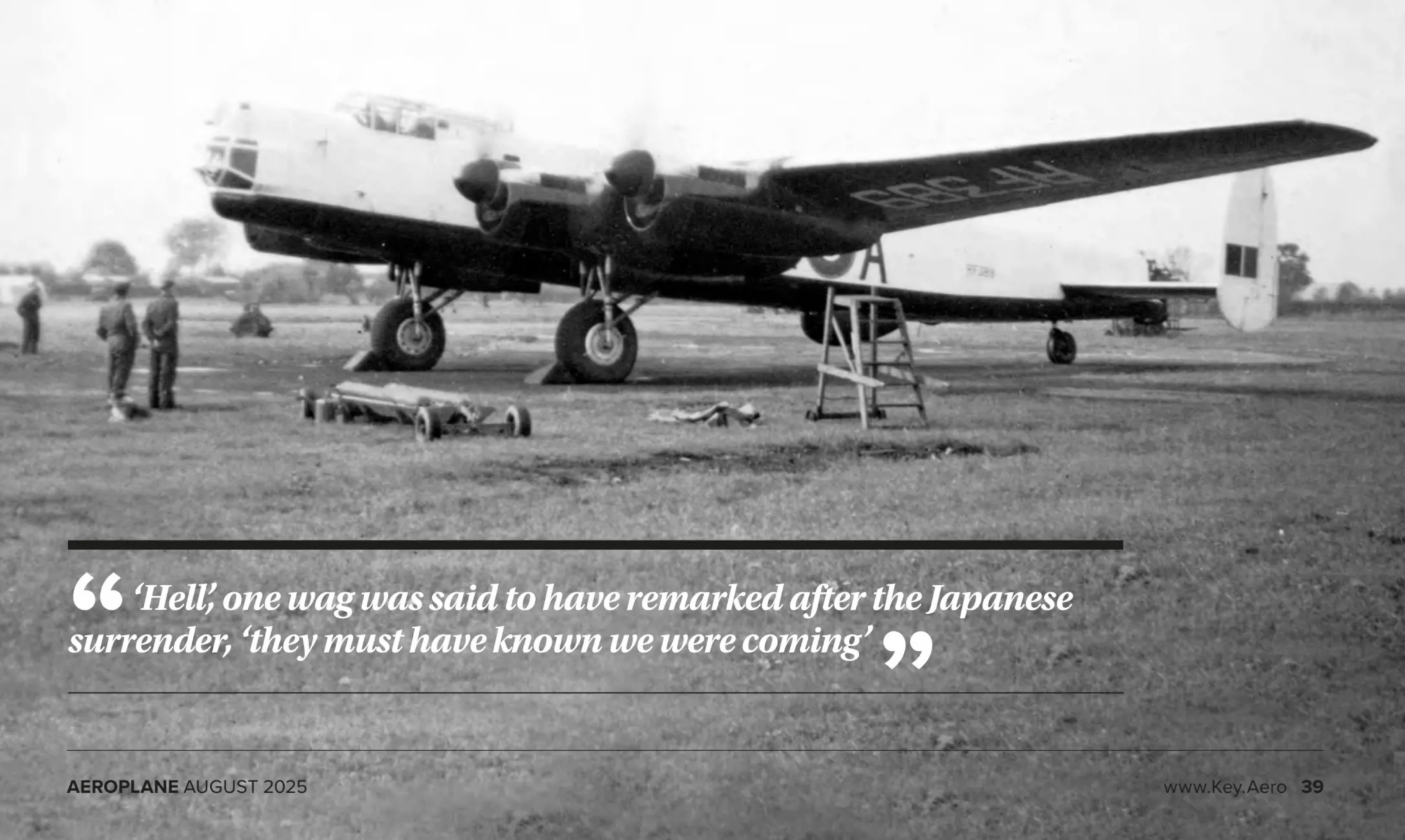
On 6 August 1945, the Americans dropped the first atomic bomb on Hiroshima. Three days later, a second destroyed Nagasaki. Within a week, the Japanese had thrown in the towel. "Hell", one wag in No 617 Squadron was said to have remarked, "they must have known we were coming."

The end of Japan meant the end of Tiger Force. 'Shield', which was due to arrive at Okinawa on the 24th, was diverted to Hong Kong. 'Vacuum', also more than half-way to its destination, went to Singapore. The force unwound almost as quickly as it had been formed. Its staff, which at the peak comprised 168 officers and 181 men, was reduced to only 16 officers and 45 men within a month. By 31 October, Tiger Force was no more.

What Lloyd and his staff achieved in the brief life of Tiger Force was little short of magnificent, given the constantly shifting sands they had to contend with and plans that were continually having to be updated. Today, we might refer to an organisation as being 'agile'. Lloyd took the definition of agility to another level.

Since the base from which his men would operate was always changing, creating a definitive plan was virtually impossible. There were simply too many variables. At the beginning, it was believed the existing Lancasters — and the later marks, the Lancaster IV and V, redesignated Lincoln I and II — would have to operate from Formosa. This, therefore, led to a huge focus in terms of time and resource in overcoming the problems with range to the target. A thorough investigation was made into in-flight refuelling, considered impossible at night, and designing a new 1,200-gallon 'saddle tank' to accommodate additional fuel loads. The staff also examined the equipment carried on the aircraft, some of which had to be designed to be 'detachable' such that it could be removed easily to save

BELOW: The first Lincoln B2 to arrive with No 75 Squadron at Spilsby was RF389, which was delivered to the unit in September 1945. VIA ANDREW THOMAS



'Hell', one wag was said to have remarked after the Japanese surrender, 'they must have known we were coming'

The much-photographed Lincoln RF385 was to meet a tragic end, crashing near Barsby, Leicestershire on 20 February 1946 with the loss of all seven on board. KEY COLLECTION

weight or omitted altogether. The conundrum was simple: the greater the distance, the greater the need for the most modern navigational aids; the greater the distance, however, the greater the need also for the aircraft to be as light as possible, in which case modern navigational equipment may have to be sacrificed.

Crew training was also affected. Longer trips meant increased crew fatigue, which in turn involved accelerating the numbers of those with the training needed to operate 14,000 miles from home. Syllabuses had to be revised and updated. Wg Cdr Clive Scott AFC, a New Zealander serving with No 627 Squadron, remembered the situation being very fluid: "We trained as best we could in the absence of a specific brief… The only thing we were sure about was that if we went, we would be flying across vast areas of water, so we made good use of the swimming pool for dinghy drill!"

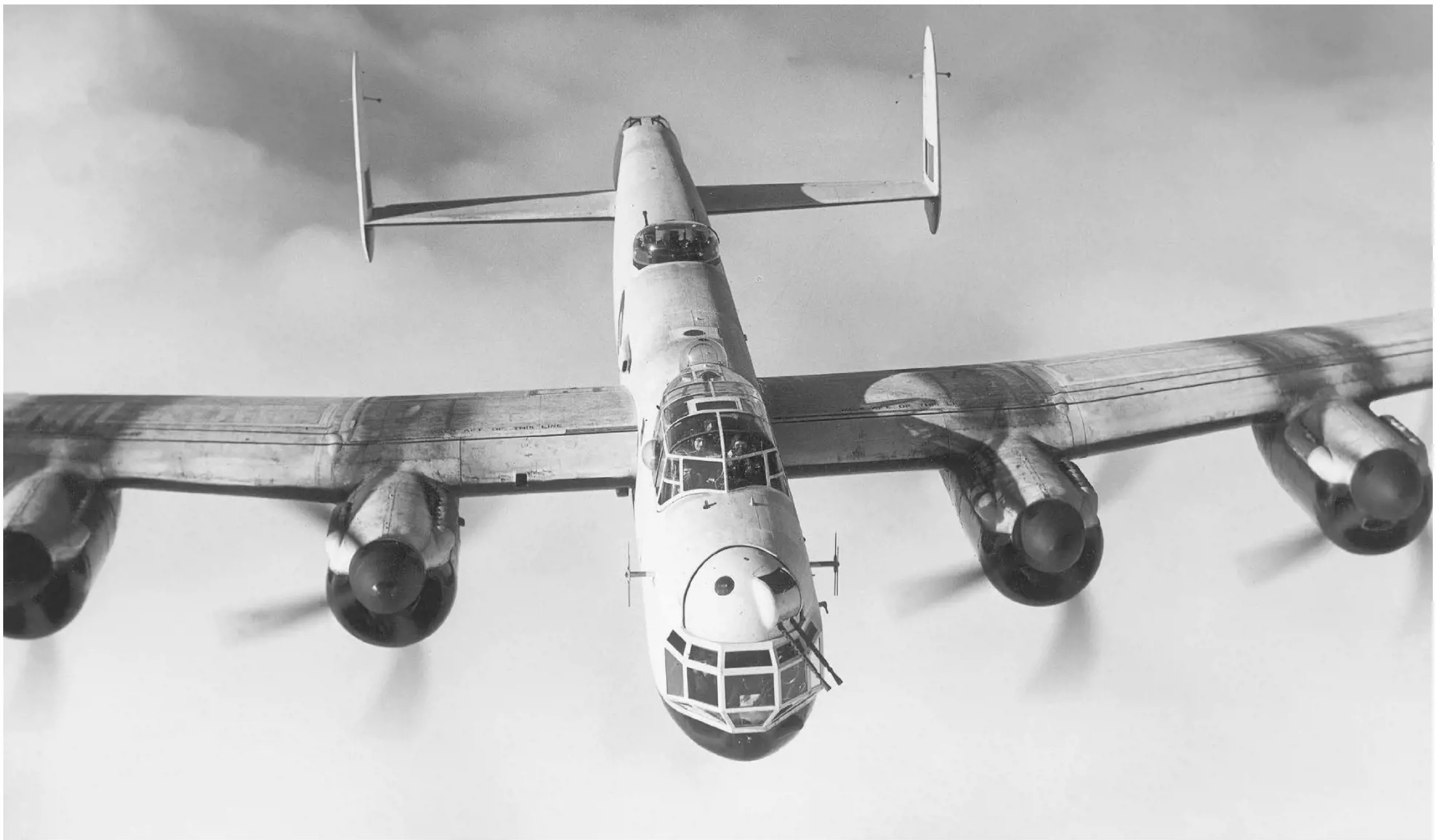
An increase in the all-up weight of the aircraft was also explored, taking a Lancaster from 68,000lb to 72,000lb (approximately 30,844kg to 32,659kg) and a Lincoln from 75,000lb to 82,000lb (34,019kg to 37,195kg), as well as the practical considerations of getting a potentially dangerously over-laden aircraft in the air, perhaps by using rockets. Safety margins became a little more 'elastic'. Even after several modifications, and with the mid-upper turret removed, a Lancaster could only just carry a 4,000lb (1,814kg) bomb load 2,600nm (4,815km) across water, whereas a Lincoln could carry half as much again a little further. The decision to focus on the Lincoln to meet the required performance of Tiger Force may then have appeared easy, had it not been for the fact that the aircraft was having considerable teething problems and the date when these problems would be fixed was uncertain.

> *"The defences were weaker over Japan"*

Most of these considerations became irrelevant, however, the moment the Ryukyu islands came into contention, and range was no longer a critical factor. The Lancaster would suffice, adapted for local conditions with Rolls-Royce Merlin 24 engines fitted with enlarged intakes and tropical filters, an enlarged bomb bay and strengthened undercarriage. Each would also feature a new Frazer-Nash FN82 rear turret but even this caused Lloyd and his team concern. Gunners soon found they could not stay seated in the turret for any period of time without suffering from cramp. This was not uncovered until trials were started by No 97 Squadron at the end of June and into July, the report in the official records repeatedly referring to it being "very uncomfortable" and cramp being "quickly experienced".

The order of battle also changed many times in the first six months of 1945. The best way of deploying 20 bomber squadrons is somewhat different from deploying only 10, not least in the tactics they would follow. A 'normal' Bomber Command operation would involve saturating the enemy defences with an overwhelming force but relied on those aircraft all being in the air at the same time and in a recognised 'stream'. This would be almost impossible on a single-strip airfield shared with the AAF's B-29s. It also depended on pathfinders who dropped their markers for the Main Force to bomb within the shortest timeframe possible. They did not want to be hanging around unnecessarily waiting for the bombers to show up; neither would their markers burn for long enough on the ground. And proximity to the target determined whether they used the 'No 8 Group method' of pathfinding using heavies at height, or the 'No 5 Group method' using low-level Mosquitos with a different operating envelope.

All that said, the Americans had already proven that concentrating a large force over a target was not needed over Japan, where enemy defences were much weaker than they had experienced over Europe. Apart from the two Tallboy squadrons, who would ironically be flying by day, the



ABOVE: **The Lincoln became operational in August 1945, just as the war in the Pacific theatre was coming to an end.**
KEY COLLECTION

British would be predominantly active at night, when Japanese night fighters posed little or no threat.

What kind of force it might have been and what impact it might have had on the air war against Japan can only be guessed at. Perhaps Tiger Force's true value may have been more show than substance. If the British media stayed true to type, the 'earthquake' bombs would doubtless have made the headlines, and No 617 Squadron would have earned the plaudits at the expense of the other squadrons taking part.

By the time the British bombers were scheduled to have arrived, the race was already run. Operation 'Downfall', the planned invasion of Japan, was to have involved two massive amphibious assaults, one on Kyushu, the other on Honshu. President Truman's advisers forecast 'Downfall' would cost a minimum 250,000 and possibly as many as a million American casualties, with an equal number of Japanese. Meanwhile, between June 1944 and August 1945 the US strategic air offensive against Japan killed more than 240,000 Japanese and injured at least 300,000. Reg Davey greeted the bombing of Hiroshima and Nagasaki as a blessing: "It very probably saved my own and many other lives on the squadron."

Lloyd is honest in his final appraisal. "Later information about American results", he wrote, "showed that by the time we deployed, most of the major area targets would have been destroyed and we should be required mainly for HE attacks and sea mining."

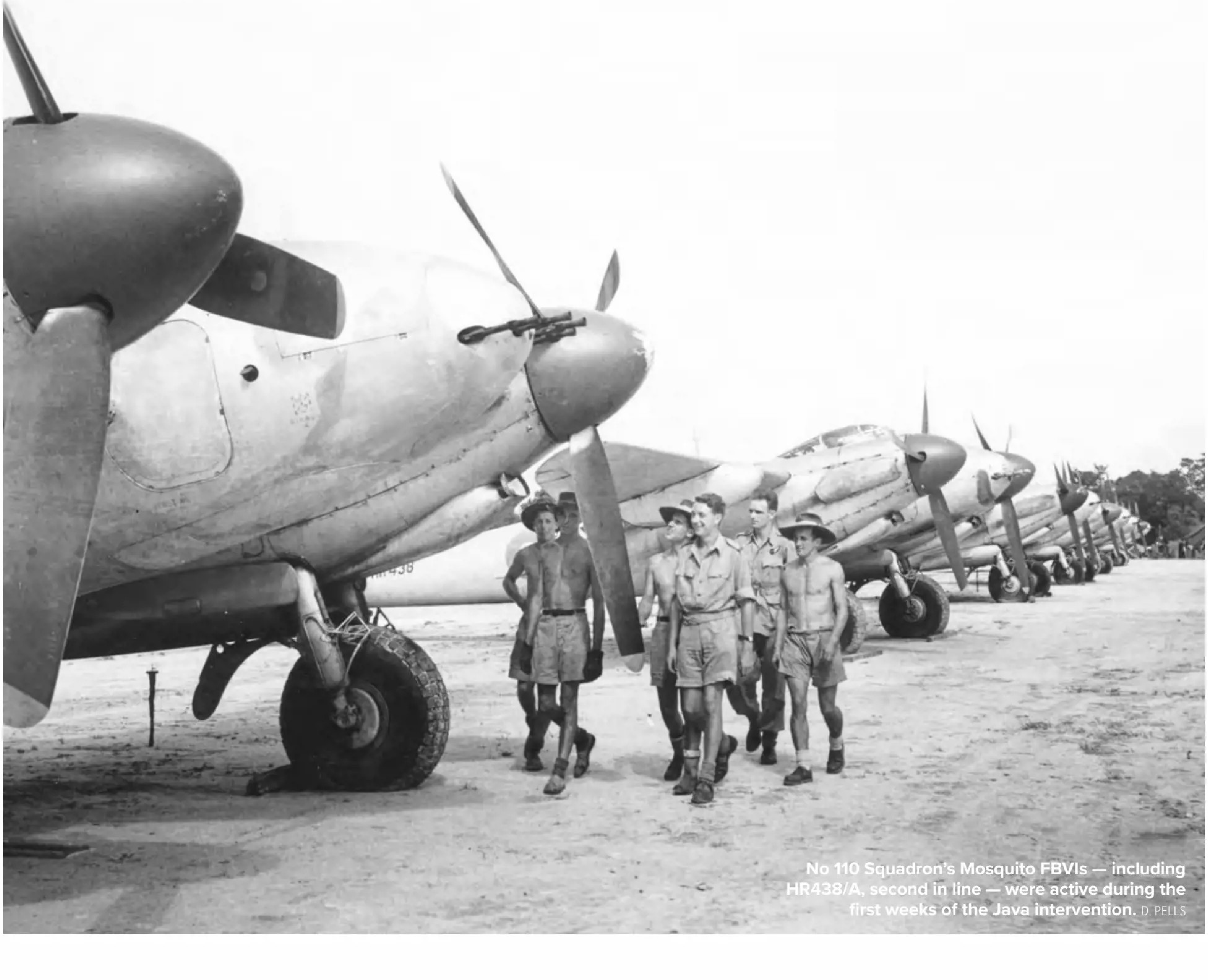
Perhaps CIGS was right — the results would have been disproportionate to the effort. But Tiger Force was, surely, more than just a gesture. Its commander certainly thought so: "We had attempted something new in the history of the Royal Air Force and it is unfortunate that the force never operated, for the experience gained and lessons learned would have been most beneficial to posterity."

ORDERS OF BATTLE

NOVEMBER 1944	
UK Group	Nos 9, 12, 44, 57, 83 (PFF), 90, 115, 150, 156 (PFF), 218, 460 (RAAF) and 467 (RAAF) Squadrons
Canadian Group	Nos 405 (PFF), 408, 413, 415, 420, 424, 425, 426,427, 429, 432, and 433 Squadrons
Nos 7 (PFF), 15, 97 (PFF), 101, 166 and 617 Squadrons were to be deployed but retained in Air Command South East Asia (ACSEA) until required for operations in the Pacific.	
JULY 1945	
No 551 Wing	Nos 9 and 617 Squadrons
No 552 Wing	Nos 106 and 467 (RAAF) Squadrons
No 553 Wing	Nos 83, 97 and 627 Squadrons (all PFF)
No 554 Wing	Nos 75 (RNZAF) and 207 Squadrons
No 661 Wing	Nos 419 (RCAF) and 428 (RCAF) Squadrons
Since only 10 squadrons were to deploy in the first phase, it was anticipated 207 would be held back and deployed with the second contingent.	

FIGHTING ON

After World War Two had ended, RAF Mosquitos still found themselves in combat out east, as several squadrons saw considerable action against Indonesian separatists in Java **WORDS:** ANDREW THOMAS



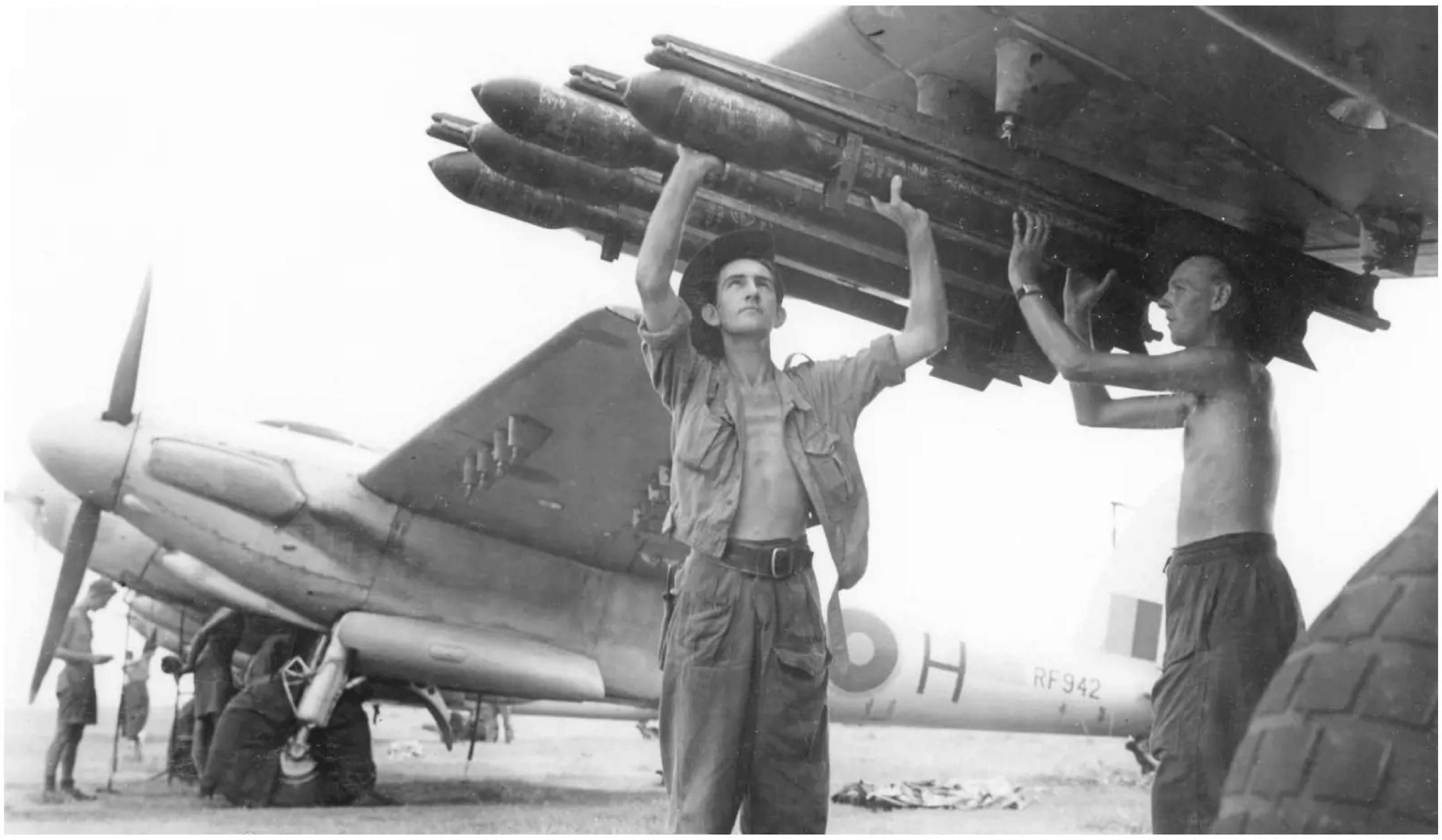
No 110 Squadron's Mosquito FBVIs — including HR438/A, second in line — were active during the first weeks of the Java intervention. D. PELLS

LEFT: Wg Cdr Michael Constable-Maxwell and his navigator Flt Lt John Quinton of No 84 Squadron flew bombing sorties throughout the unit's period in Java. CROWN COPYRIGHT

Japan's surrender in August 1945 did not mean an end to operations by British forces in the Far East. The vast Netherlands East Indies territories, including the islands of Java and Borneo, were added to the area of responsibility for the British-led South-East Asia Command on 15 August. Two days later the Republic of Indonesia was declared by the separatist leader Sukarno after the Japanese capitulation, intending to resist a return of Dutch colonial rule. The Japanese handed weapons to the separatists, who were also suspicious of British forces which landed to disarm the enemy and repatriate prisoners. All told it was estimated there were more than 100,000 PoWs and internees in the area, many in poor health and enduring the most appalling conditions, so they represented an urgent priority for the Allies.

To support the 23rd Division, which began landing at Java's capital Batavia, Air Headquarters Netherlands East Indies was formed under the leadership of Air Cdre Cecil Stevens. Part of it was No 904 Wing headed by Gp Capt David Lee. They moved into Kemajoran near Batavia — now Jakarta — on 17 October, followed on the 21st by the Republic Thunderbolts of Nos 60 and 81 Squadrons. The division then pushed south-west to occupy Java's second city of Bandoeng, but as it was impractical for British forces to take the entire island it was intended to secure three large bridgeheads into which the former PoWs and internees could be brought for safe processing and repatriation.

It was quickly realised that the initial RAF forces deployed were insufficient, so reinforcements were sent from Singapore to Java. Thus a detachment of eight Mosquito FBVIs from No 84 Squadron, commanded by Wg Cdr Michael Constable-Maxwell, and a further six from No 110 Squadron flew to Kemajoran on 31 October. From there, 84 carried out the first operational Mosquito sortie the next day when Flt Lt Tissington and Fg Off Childs in RF766/PY-A conducted an armed reconnaissance of the Magelang area. They saw mortar and



LEFT: Mosquito RF942/KU-H of No 47 Squadron was flown by Flt Lt Jacob-Hood and WO Gibson to reconnoitre the radio stations at Soerakarta and Jogjakarta on 24 November. It was pictured the next day as the nearest aircraft is loaded with rockets for the attack. GEORGE MELVILLE-JACKSON

Wg Cdr George Melville-Jackson was the CO of No 47 Squadron and led the unit on operations against Indonesian separatists. GEORGE MELVILLE-JACKSON

BELOW: The nose of Mosquito RF713/KU-L retains its impressive wartime bomb log as Flt Lt Jacob-Hood, in the lifejacket, discusses the attack on the Soerakarta radio station. J. D. GIBSON

artillery firing and roadblocks, and that many of the buildings were flying the Indonesian flag. Further recce sorties took place over the next couple of days, one by 84's WOs C. V. Thomas and K. Coles in RF493/PY-H finding a number of trains loaded with troops, while it was also noted that some streets in Batavia had been blocked with fallen trees.

Though the Batavia area was strongly held by the 23rd Division and remained relatively quiet, elsewhere the situation was very unstable. In central Java around Semarang and in the east near Soerabaya it was much more dangerous, and the British landing by the 5th Division was bitterly opposed by the well-armed Indonesians. In Soerabaya the murder of Brig Mallaby, commander of 49 (Indian) Brigade, and the detention of a party of RAF officers resulted in increased tension and the need for swift action. Additional troops and eight Thunderbolts and Mosquitos from both squadrons, all under the command of 84's CO, Wg Cdr Michael Constable-Maxwell, moved to Soerabaya on 9 November, a leaflet drop by a Mosquito from 110 warning the Indonesians to surrender their arms.

> *“‘Soerabaya Sue’ had been silenced”*

Men of the 5th Division began operations at Soerabaya early on 10 November, backed up by air and naval units. The RAF's first effort in the east involved two attacks by Thunderbolts and Mosquitos on buildings — Government House and the post office — occupied by the insurgents. The bombing was reasonably accurate, Fg Off Chasney and Flt Lt Pettit of No 84 Squadron putting a bomb through the door of their target, though it failed to explode.

In all the RAF dropped 18 bombs, 10 of which were direct hits resulting in all target buildings being destroyed or badly damaged. Several aircraft were damaged by small arms fire, including Bob Chasney's TA497/PY-X which was hit twice by anti-aircraft fire, as he recalled afterwards: “During my first run over the marshalling yards south of Soerabaya, little flak was seen. But, on the second run, continuous ack-ack was encountered. It was becoming increasingly accurate both for height and direction”. Another of 110's aircraft was hit in the wing, while Mosquito VI RF948 failed to get airborne when taking off from Soerabaya, struck a gun post and crashed, killing Fg Off Phillip Osborne and his passenger, an army brigadier. It was the start of three weeks of intensive fighting.

A No 110 Squadron Mosquito flew a recce ahead of the next major attack by the RAF, which took place on 12 November, a pair of Mosquitos and eight Thunderbolts striking rebel strongpoints near Soerabaya. Wg Cdr Constable-Maxwell and his navigator Flt Lt John Quinton flew two bombing sorties in RF759/PY-F and later in the day a third, this time in RF961/PY-T. On this sortie they bombed the Hotel Brunet in pouring rain, making two runs and also hitting a machine gun position, after which some bodies were seen. A Bofors position was strafed and hits noted on houses around, though the tracer fire was accurate.

It was not only Indonesian fire that caused damage. When No 110 Squadron's Flt Lt Hammond flew a ‘Nickel’ leaflet-dropping sortie on the 13th, a bundle hit the aerial, causing it to break off and leaving a hole in the aircraft's tail. This was followed by a bombing attack when No 84 Squadron Mosquitos hit the rail marshalling yard at Sidotopo, which was used by the insurgents.

WO Rendell and Fg Off Wynne, again from 110, likewise experienced the accuracy of Indonesian ground fire. They too attacked the marshalling yard, targeting several rail wagons and starting a fire in the corner of the area, but their aircraft was hit and both men wounded — Rendell in the shoulder, while Wynne lost three fingers on his left hand. They landed safely, though the undercarriage was damaged.

As the fighting around Soerabaya persisted, on 15 November Fg Off Bob Chasney flying TA497/PY-X and WO Thomas in RF961/PY-T again had government buildings in their sights, while one of 110's aircraft strafed a locomotive and left it smoking; additionally, two Indonesian gun positions were hit. Wg Cdr Anthony Binks, the squadron CO, flew across to join the detachment at Soerabaya, though on the 20th it was instructed to return to Singapore and make way for a detachment of No 47 Squadron whose aircraft were capable of firing rocket projectiles. 110's diarist stated with feeling, "News *not* well received!"

◆

Central Java witnessed heavy fighting around the city of Semarang during early November. On the 11th Fg Off Collins of No 110 Squadron flew a recce of Magelang, some 50 miles south of Semarang, from where a trapped Gurkha garrison was only withdrawn with air support from the Mosquitos and Thunderbolts. Armed recces on 18 November included a strike by three Mosquitos on rebels in the Ambarawa area, preceded by a leaflet drop warning of the impending attack.

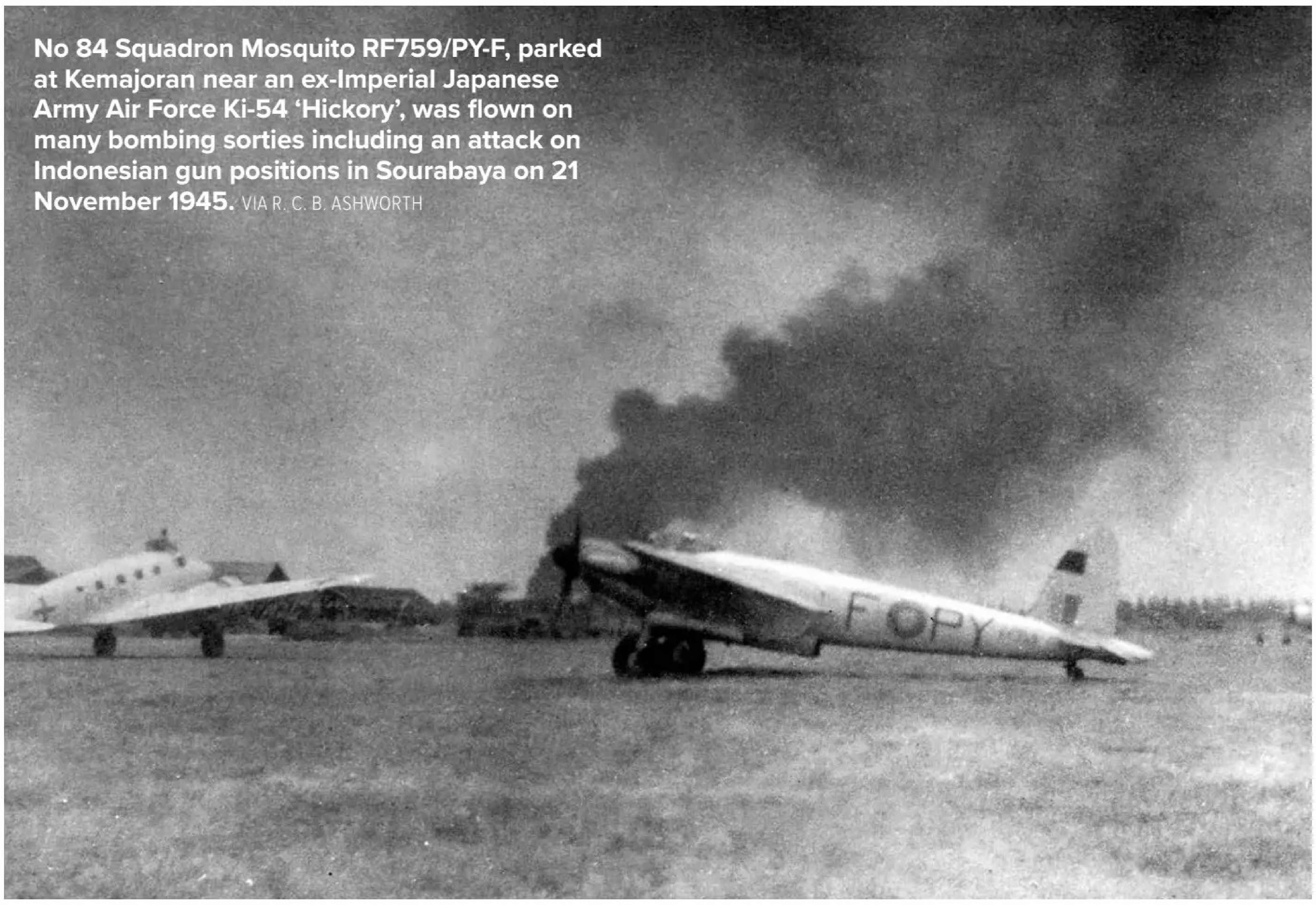
The Indonesian insurgents used radio broadcasts to spread propaganda and misinformation to the local populace about British intentions. A prime exponent was the Scottish-born Indonesian nationalist female broadcaster K'tut Tantri, previously Muriel Walker, whom the press had christened 'Soerabaya Sue'. The detachment of No 47 Squadron's Mosquitos under Wg Cdr George Melville-Jackson reached Kemajoran on 17 November, and one of the navigators was WO Jimmy Gibson, who recalled, "This was a rather troubled time and, I believe, there were rumours that Sukarno — later President Sukarno of Indonesia — was intending broadcasting to the Indonesians in an attempt to get them to rise up against the British and Dutch and throw them off the island. There were two radio stations from which this was possible, one at Soerakarta and the other at Jogjakarta."

Operations for the No 47 Squadron detachment began on the 24th when Flt Lt A. J. Jacob-Hood DFC with WO Gibson in Mosquito RF942/KU-D and Flt Lts P. A. S. Payne and H. C. Hopwood in RF946/KU-V reconnoitred those two radio stations. The former was identified with masts, aerials and a 50ft pylon with an Indonesian flag flying, but the latter was difficult to spot; the building believed to be the wireless station was seen but could not be corroborated.

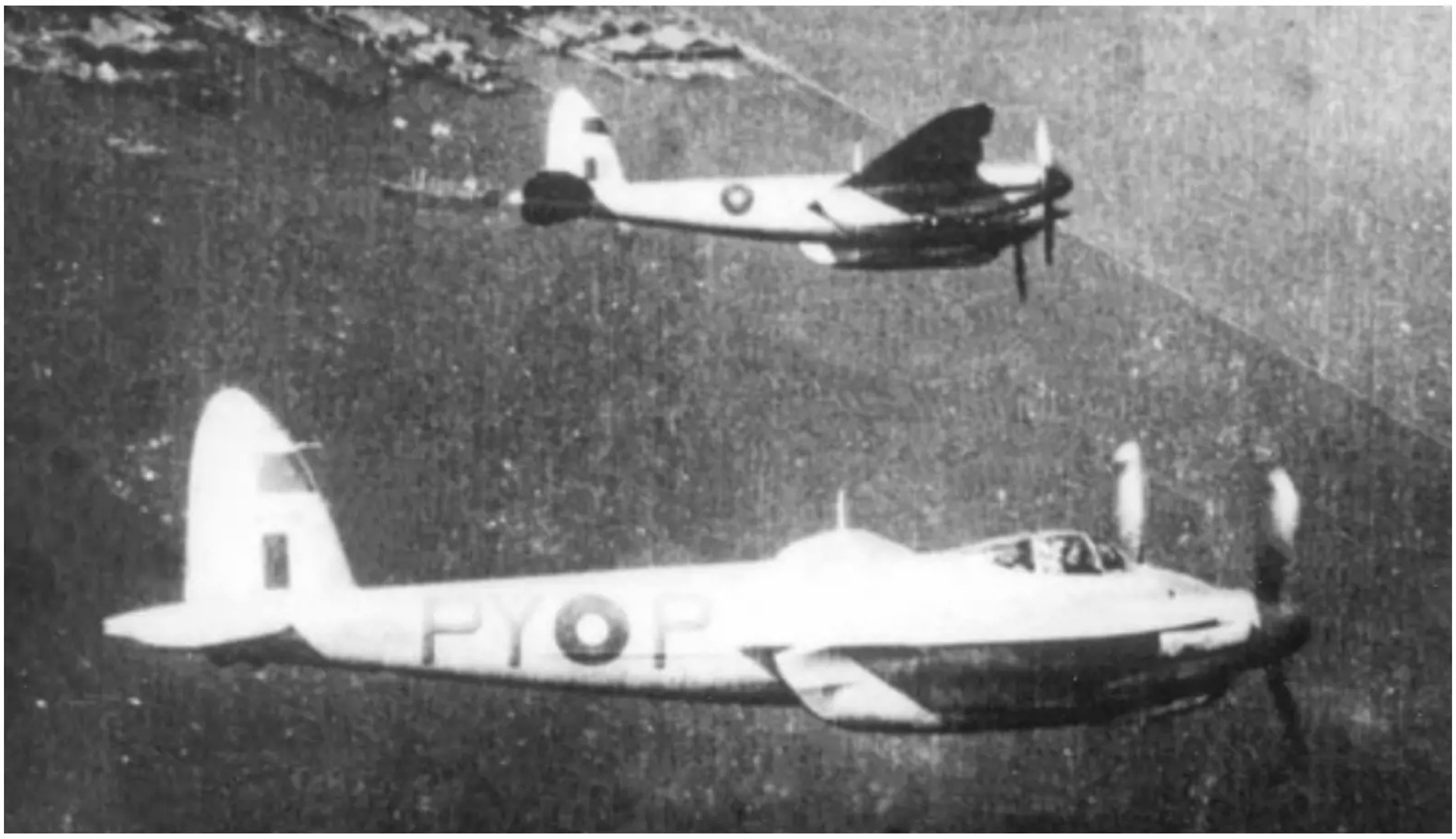
Shortly after 07.00hrs the following morning, four Mosquitos, each armed with eight 60lb rockets, took off to attack the sites. First off were RF949/KU-S, flown by Payne and Fg Off W. H. C. Ayling, leading Hopwood and Flt Lt R. W. Watson in RF695/KU-Y; they headed for the Jogjakarta radio station. After identifying the target it was attacked, obtaining hits on the building with 13 rockets and two others hitting nearby bashas. The second pair flew a few miles north-east to attack the other station at Soerakarta. In the lead were Jacob-Hood and Gibson in RF713/KU-L with RF749/KU-G flown by Flt Lt H. J. Wallis and Plt Off P. S. Rostance. The two Mosquitos made four attacks with rockets and three strafing runs with cannon. Nine direct hits were observed and the building was heavily damaged, though no fires were seen. Jimmie Gibson said, "On the morning of the 25th we blew both stations up with rockets, and I understand they were never heard on the air again". As the squadron record said, "Soerabaya Sue had been silenced."

Melville-Jackson's next trip was with Flt Lt Wise as navigator in RF649/KU-J, as he recalled: "My first attack in Java against the

ABOVE: Scottish-born Muriel Walker adopted the local name K'tut Tantri but was christened 'Sourabaya Sue' when she became an Indonesian nationalist broadcaster. NATIONAAL ARCHIEF



No 84 Squadron Mosquito RF759/PY-F, parked at Kemajoran near an ex-Imperial Japanese Army Air Force Ki-54 'Hickory', was flown on many bombing sorties including an attack on Indonesian gun positions in Sourabaya on 21 November 1945. VIA R. C. B. ASHWORTH



RIGHT: During late November, Mosquito RF726/PY-P flew three armed recce sorties over Sourabaya. P. H. T. GREEN COLLECTION

separatists was on 28 November when in the late morning I led four of my aircraft to destroy a roadblock that had been set up at Bekasi, which was a town just outside Batavia. We made contact with the army column within a few minutes of getting airborne and, having visually identified the enemy strongpoint, promptly destroyed with R/P. There was a bit of small arms fire and my Mosquito was hit by a round in the fuel tank in the starboard wing. We then remained overhead whilst the column drove through the area.

"The next day I led eight Mosquitos and four P-47s in an attack that had been requested by the army commander onto gun positions manned by Indonesian rebels in the town of Ambarawa. The town was an important rail link in central Java between the towns of Semarang and Salatiga when our troops were trying to evacuate to safety the many civilians that had been interned there by the Japanese. The rebels had been regularly attacking our troops and so we went down and gave the area around the rebel positions a regular pasting with R/P and cannon fire. We were told afterwards by the army that the attack had been very successful."

Further east, No 84 Squadron lost Mosquito TA447/PY-J and its crew of Sqn Ldr Bernard Slip and Flt Lt Trevor Andrews in the early afternoon of 1 December when it crashed during a strafing run against enemy road transport. The wreckage came down among the cars it had been attacking, though it was uncertain whether it had been shot down. Another of the unit's aircraft was claimed on the 8th when RF961/PY-T, flown by Flt Lt James Taylor — who had No 110 Squadron's Flt Sgt Eric Hale as his navigator — crashed near Batavia. The cause was unknown, but structural failure was suspected. Nonetheless, there was no suspension of operations.

"The rain and humidity resulted in problems"

While escorting a VIP convoy on 21 December, Constable-Maxwell and Quinton dived to strafe a locomotive in RF743/PY-H, making three runs. They also found and attacked a second train. By now there were serious doubts about the structural integrity of the aircraft, so at the end of the month all Mosquitos were grounded for inspection of the main spars. Fortunately, fighting had largely died down, for there were no offensive air operations. Some road convoy escorts and armed reconnaissances continued with available aeroplanes, No 47 Squadron sending a small detachment to Soerabaya to help 84. The whole of the latter unit went on to move to Kemajoran from Singapore, though heavy rain and high humidity resulted in ongoing major technical problems for the wooden Mosquito.

No 47 Squadron ceased operations in Java on 12 March, having flown 77 sorties amounting to 143 hours. No 84 Squadron resumed activities in the late afternoon of the 15th, Fg Off Matta and Flt Sgt Fraser conducting a convoy patrol over the mountain road from Buitenzorg to somewhere referred to in period accounts as Tjanadjoer. It was the unit's first operation for almost two months, and there would be patrols of army convoys moving between Batavia and Bandoeng, together with recces to Tjilatjap on the south coast, over the next few days until a further grounding was ordered. This was rapidly rescinded and 50 sorties were flown during April.

Through a concerted effort by the groundcrew, on 9 April a dozen Mosquitos were available to escort the aircraft carrying the C-in-C into Batavia, in a show of force as much as anything. With negotiations ongoing, No 84 Squadron began returning to Malaya in early May, and by the 13th the Mosquito's part in the Netherlands East Indies had ended. Like so much of what the RAF did in the Far East 80-odd years ago, these missions have all but faded from view. They don't deserve such obscurity.

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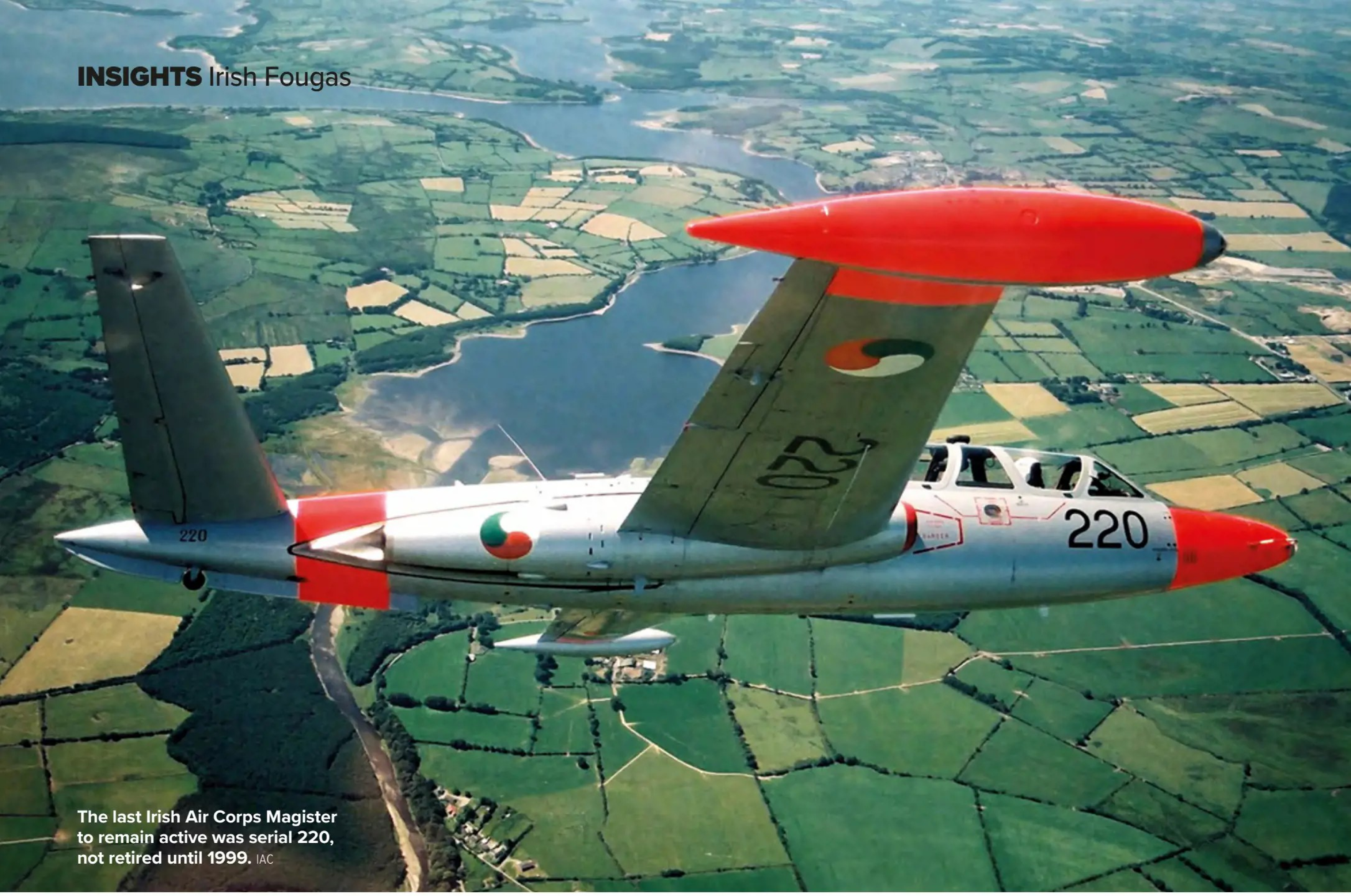


The last Irish Air Corps Magister to remain active was serial 220, not retired until 1999. IAC

IRELAND'S FANTASTIC FOUGAS

If one aircraft was synonymous with the Irish Air Corps for more than two decades from the 1970s to the 1990s, it was the Fouga Magister. To mark 50 years since the delightful 'V-tailed' jet entered Irish service, in the first half of a two-part feature, some of those who flew it recall their days in the Air Corps' most potent asset of the era

WORDS: JOE MAXWELL

LEFT: **The old and the new of Irish jet training: Vampire T55s flank a freshly delivered Fouga.** IAC

The Irish Air Corps had been operating the de Havilland Vampire T55 two-seat trainer since 1956. To begin with it was a thoroughly modern machine — the tip of the spear as far as the Air Corps was concerned, ushering in a new era of aircraft to replace obsolescent types from the Second World War. The Vampires were on the strength of No 1 Fighter Squadron at Baldonnel and became a popular sight during flypasts at annual Easter parades in Dublin. Officer cadets could expect to begin their basic training on the de Havilland Canada Chipmunk, followed by the Percival Provost and finally moving on to the Vampire before receiving their wings. This training regime suited the Air Corps' needs very well for many years, but by 1973 it was clear the useful life of the twin-boom type was coming to an end.

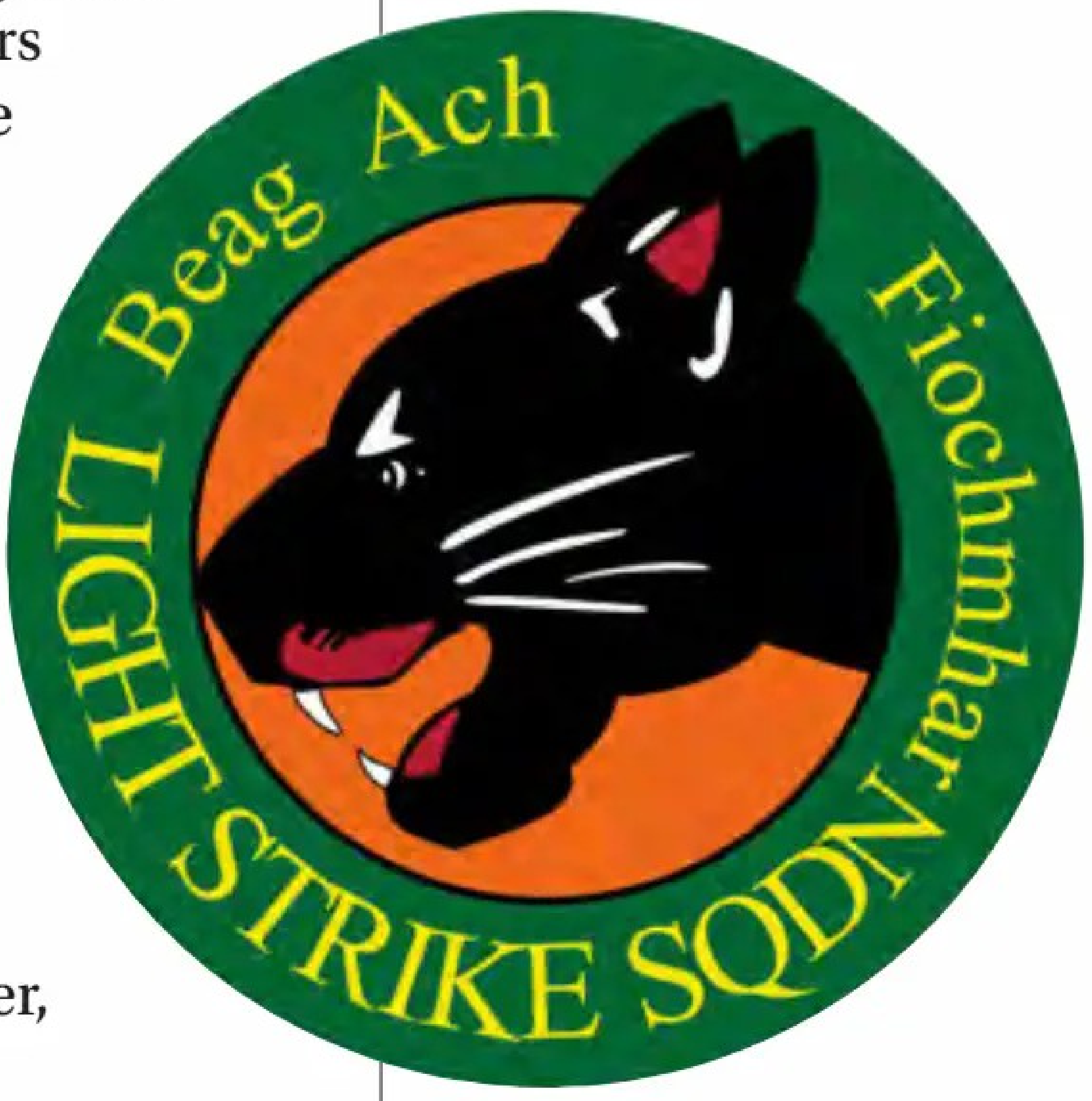
The service's chief technical officer, Lt Col James 'Jimmy' Teague, was tasked with finding a replacement. Conscious of the problems the service was experiencing in keeping the aged Vampires flying and ever-mindful of the stringent budget restrictions that were a fact of life in Ireland, Teague's priority was to find an aircraft that was cost-effective and relatively easy to maintain. He drew up a shortlist of four types: the Fouga CM-170 Magister, Cessna T-37C, Aermacchi MB326 and BAC Jet Provost T55. As it transpired only two were subsequently evaluated, these being the Fouga and the MB326.

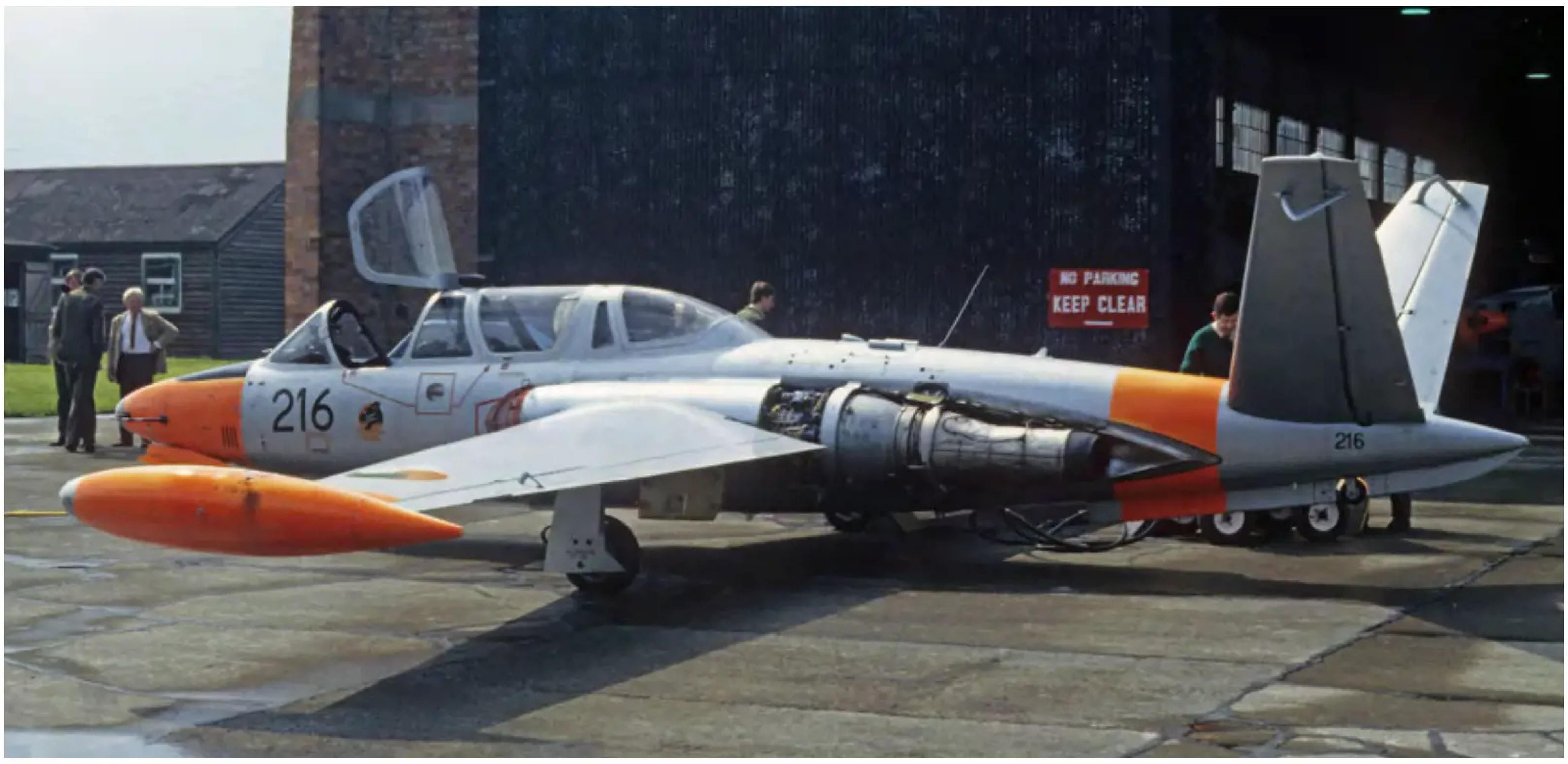
The Magister, known simply as the Fouga by those who flew and maintained it, was operated by no fewer than 20 air arms, eight of which also used it as the mount for their aerobatic display teams. On 21 March 1974 a deal was signed between the Irish Department of Defence and the Société Nationale Industrielle Aérospatiale (SNIAS) head office in Paris for six CM-170-2 Super Magisters. These were to be refurbished second-hand aircraft, their Turbomeca Marboré II engines replaced with Marboré VIs which had more thrust and doubled the time between overhauls from 600 to 1,200 hours. After some delay, the first two were delivered on 11 September 1975, followed by two more in February 1976, and the last pair on 13 November 1976.

The six Magisters offered to the Air Corps had interesting histories. Four of them had served with the Austrian Air Force. Purchased in 1959, the Fouga was operated by Austria until 1972, when it was replaced by the multi-role Saab 105. The Magisters were sold back to SNIAS in part-payment for Alouette III helicopters and put up for sale by the French company.

The other two aircraft purchased from SNIAS had been part of a batch of six destined for Katanga in 1961, and in effect were sister-ships to the Fougas used on the attacks against Irish troops at Jadotville in September 1961. However, they never made it into service with Katanga, as they were the subject of a UN embargo. Eventually they came into the possession of SNIAS, which was busy selling refurbished Magisters throughout Africa, Asia and South America.

It was planned from the start that the Fouga would be fitted with modern navigation aids to Air Corps specifications. These included a 720-channel VHF radio and a VOR/ILS (VHF omni-





LEFT: **Newly taken into the Air Corps inventory, Magister serial 220 was one of the first two ex-Austrian examples to be delivered to Baldonnel in 1975.** FERGAL GOODMAN

ABOVE: **Had original plans for this airframe reached fruition, what became serial 219 would have served in the breakaway African state of Katanga, rather than Ireland.** P. R. DUFFY

directional range/instrument landing system) receiver with DME (distance measuring equipment). Design and fitment of the avionics was overseen by Aer Lingus staff at Dublin Airport. Fouga 215 served as the pattern aircraft for the installation and spent some months at the airline's maintenance facilities, having arrived there on 22 September 1975. The work was completed six months later, 215 returning to Baldonnel on 22 March 1976. Thereafter the process took about six weeks per aeroplane.

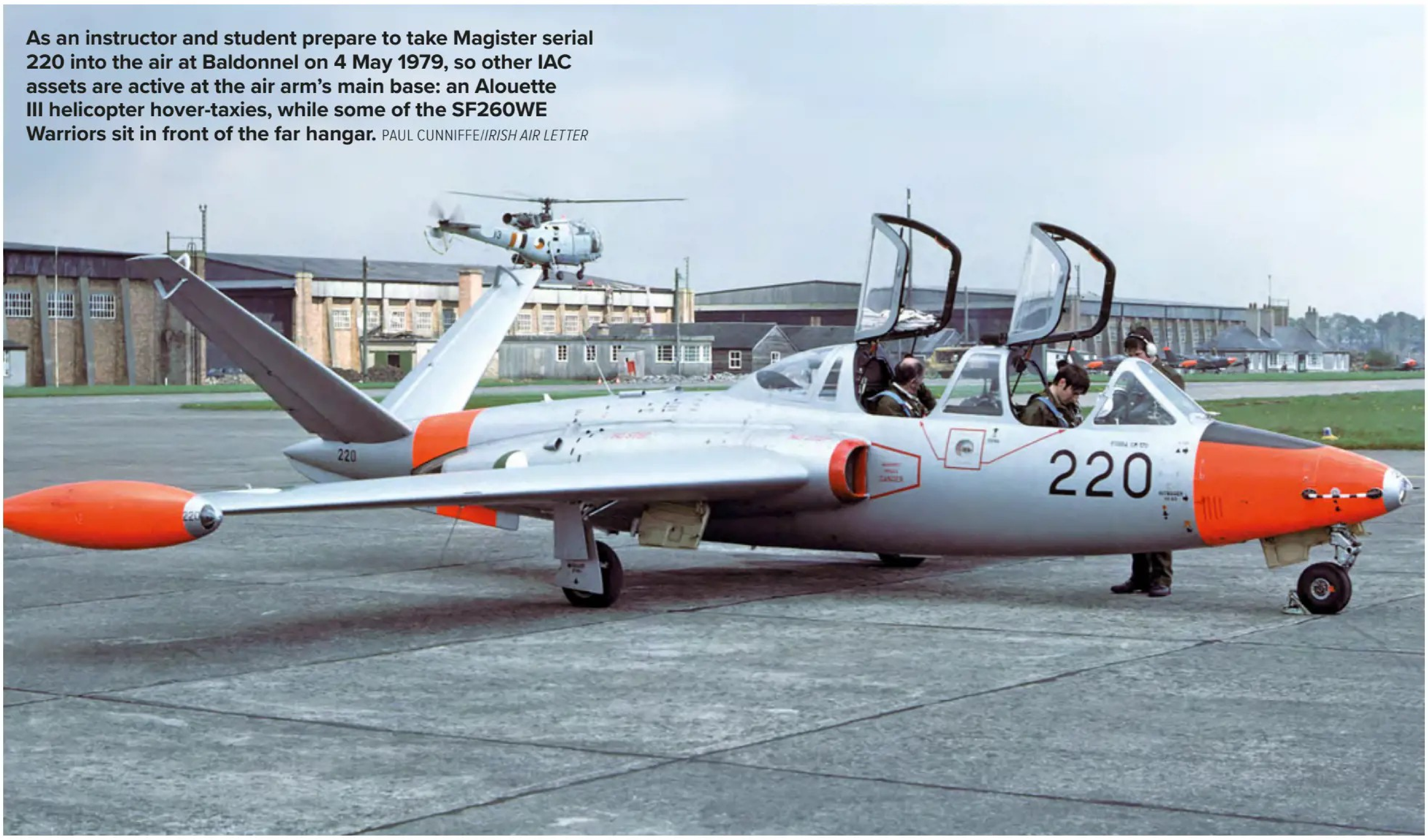
Although the Fougas were operated by No 1 Fighter Squadron they were shared on an 'as needed' basis with the Advanced Flying Training School when wings courses were being held. As experience in operating the jet grew, each class flew more hours on it. Just as the Fouga had replaced the Vampire in the advanced training role, the Air Corps superseded the Chipmunk/Provost combination for basic flying training with the SIAI-Marchetti SF260WE Warrior, the first of these arriving in 1977. The pairing of Marchetti and Fouga was to last for more than 20 years until the withdrawal of the Fouga in 1999. The Marchetti was operated by the Basic Flying Training Squadron (BFTS) and students were expected to complete 150 flying hours on it before moving on to the Fouga for a further 50 hours in order to finish the wings course.

A debut major public display for the Magisters took place on 26 August 1979 when 216, 218, 219 and 220 made a formation flypast at the Air Spectacular event at Fairyhouse racecourse. Although no aerobatics were flown at this stage, this was to be the first of many appearances by the Fougas at air displays at home and abroad.

> ***"We tried to become what Light Strike Squadron meant"***

A reorganisation of the Air Corps during 1980 saw No 1 Fighter Squadron become the Light Strike Squadron, a name more reflective of its actual role. Capt John Flanagan was made acting officer commanding in 1981 and started to work out the tactics that would be required to use the Fouga in an operational ground attack role should the need arise. The Israelis had employed the nimble jet for attack duties during the 1967 and 1973 conflicts with Egypt and Syria.

John recalls, "I had spent two very enjoyable years at Gormanston as an instructor with Army Co-Operation Squadron before returning to Baldonnel as an instructor with BFTS [Basic Flying Training Squadron]. At that time, it was only the instructors who flew the Fougas on a regular basis, and then only when there was a wings course running. The Fouga-rated instructors were often working back in BFTS as and when needed, so it was a very flexible use of available manpower. When I was designated as acting OC of Light Strike Squadron, I was the only pilot permanently assigned to the squadron. That situation continued for a few years with my staff of instructors moving back and forth between BFTS and Light Strike Squadron. I felt very strongly that there needed to be new pilots assigned to Light Strike Squadron on a full-time basis. I asked for, and was assigned, two very capable men straight from their wings course in 1984, Lt John Kelly and Lt John Mulvanny. Together the three



As an instructor and student prepare to take Magister serial 220 into the air at Baldonnel on 4 May 1979, so other IAC assets are active at the air arm's main base: an Alouette III helicopter hover-taxies, while some of the SF260WE Warriors sit in front of the far hangar. PAUL CUNNIFFE/*IRISH AIR LETTER*

pilots developed the operational conversion course for the Fouga that would include low-level navigation, night flying, formation flying, air firing and tactics for army support flying."

Retired Cdt John Mulvanny was the young lieutenant referred to by Flanagan. He went on to be a flying instructor in 1987 and leader of the Silver Swallows aerobatic team for 1990, and says, "I've been very lucky in that along with John Kelly, I've probably done more air firing from Fougas than anyone else in the Air Corps. We managed to fire an awful lot of 68mm rockets as they were coming close to being time-expired and would have to have been disposed of anyway.

❖

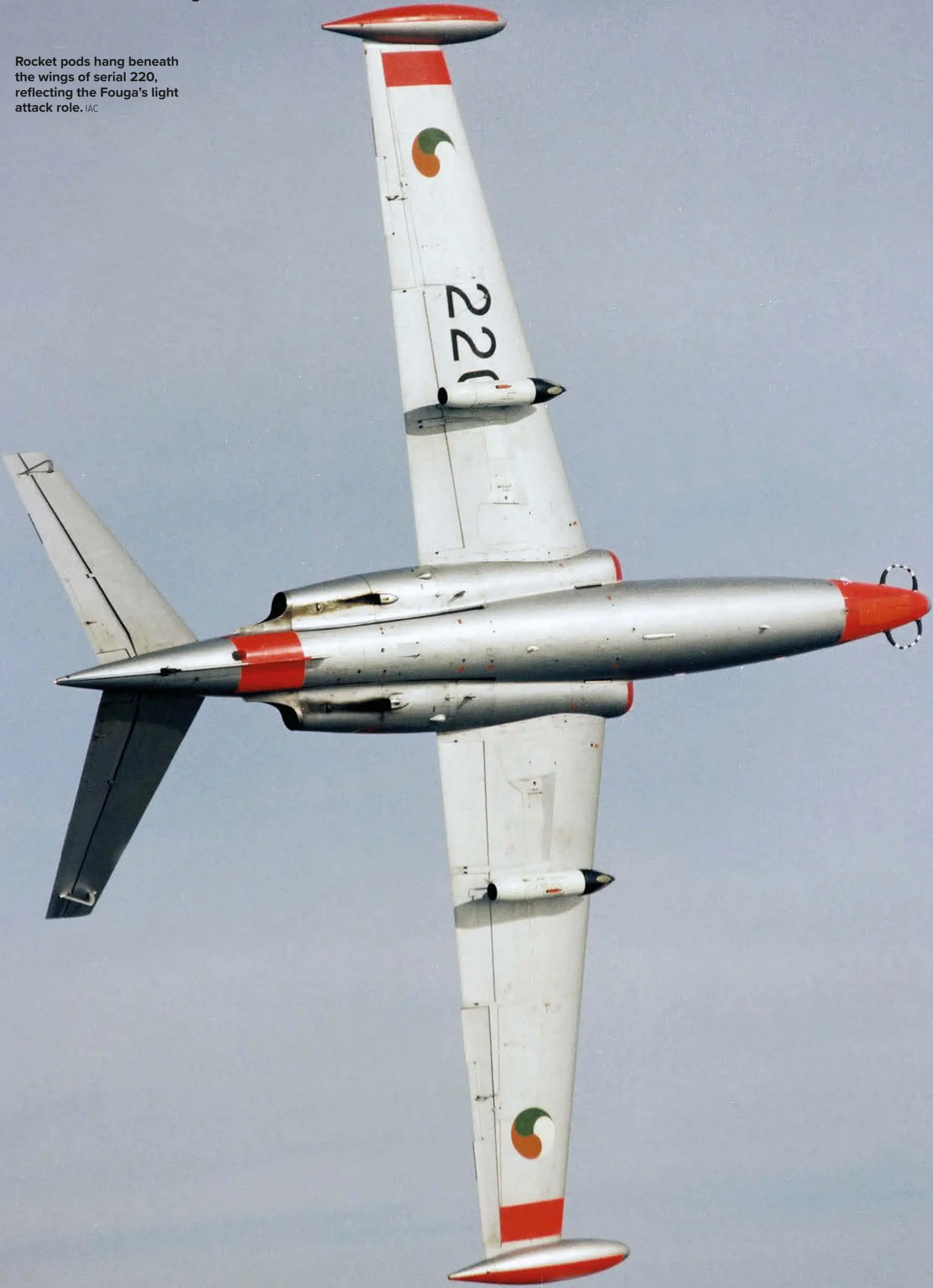
"We were trying to develop into what ultimately Light Strike Squadron should have meant, in that if you wanted a tactical two or three-ship formation to support an army operation, we could do it. We developed the course which covered topics such as how you organise an IP [initial point] then pull up, acquire target, fire and out again, using it in much the same way as the Israelis had done in 1967. We carried out many exercises with the army and navy, but it was more for their benefit in learning how to deal with an air attack rather than combined operations where they would call for air support from a tactical formation of Fougas."

Although the Magister was quite low-powered, that didn't hinder its tactical use too much. As Mulvanny explains, "The relative low power available on the Fouga was a limitation in formation aerobatics but anything you wished to do in tactical flying you could perform at the maximum capability of the aircraft. For example, we were always trading off speed versus endurance. We flew from Dublin to Cork airport in 17 minutes on one occasion at full power, but we probably only had an endurance of 30 minutes at that power setting. The normal endurance of the Fouga was somewhere between 50 minutes to 90 minutes depending on what power setting and altitudes were used. A low-level navex [navigational exercise] would be carried out with the engines running at 18,500rpm out of a maximum of 21,500rpm available, which gave an endurance of around 55 minutes, whereas formation aerobatics needed greater power, so were completed at 19,500rpm with an endurance of about 45 minutes.

"We were very fortunate to have had John Flanagan as OC, to trust and encourage us to operate the Fouga to the maximum. We trained in all the flying disciplines, firstly to learn and then operate the aircraft to the very edge of what it was capable of doing. In those early years comparisons with other aircraft don't even come into mind. Of course, if we had the opportunity to operate in conjunction with aircraft of other nations, then we might have made comparisons and perhaps then wished for many things — more power, higher roll rate, higher speed, better instrumentation, weapons, guidance systems, ejector seats; the list would have become quite long! However, in 1980s' Ireland this multi-national co-operation was simply not a possibility. As I reflect back on that time, though, it didn't matter… I was just thrilled to have had an opportunity as a 20-year-old to fly a twin-engine jet trainer to its maximum and it was absolutely brilliant."

As the years progressed the training value of having jet aircraft available for exercise scenarios came to be appreciated by the army, which had a long-standing commitment to UN peacekeeping operations in Lebanon. Irish troops were part of the UNIFIL (United Nations Interim Force in Lebanon) contingent based in south Lebanon, close to the border with Israel, and when trouble flared between warring factions in the region it was not uncommon for strikes to be carried out by Israeli aircraft in the Irishbatt area of operations. The army realised it would be useful if troops working up for their overseas deployment could be exposed to mock aerial attack.

As Paul Whelan explains, "To provide training for troops going overseas on UN missions we flew simulated air attacks over the Glen of Imaal army range, usually upon 'dug-in' troops on exercise. These were usually planned in advance with the



Rocket pods hang beneath the wings of serial 220, reflecting the Fouga's light attack role. IAC

A close-formation Magister sortie, with serial 218 on the wing. IAC

Corps of Engineers. As live firing from aircraft was not permitted over the glen at that time, the engineers used a series of HE [high-explosive] charges. These charges were buried at safe distances from the trenches, yet close enough to simulate a strafing run by an attacking aircraft.

"We would meet with the exercise co-ordinators and the engineers to plan the entry and exit points for the simulated attack. These 'runs' between these points would coincide with the orientation of the laid HE charges. As we passed over the dug-in positions, the engineers would flick a series of toggle switches on a control board which realistically simulated a strafing run."

It was not just the army that benefited from the participation of the Fougas in military exercises. They joined several notable naval exercises such as September 1981's 'Dan Buoy IV', in which a pair of Magisters staged attacks on Irish naval vessels operating in the Irish Sea. In September 1992, 'Red Tide' saw two of the jets flying from Cork Airport to conduct simulated strikes off the Old Head of Kinsale on the south coast of Ireland.

The now retired General Officer Commanding the Air Corps, Brig Gen Paul Fry was the forward air controller on that exercise. "We spent a week enduring force 8 gales doing 8kt with six other naval ships for company. On the day of the air attack there were warm sector conditions — low cloud, slight rain or drizzle — and the Light Strike crews did really well to surprise the flotilla, flying a low-altitude approach and using the backdrop of the coast to mask them from the ships' radars."

Spin training is an essential part of any aircraft handling course, but the Magister had unique peculiarities in this respect due to the 'V-tail' configuration. As John Mulvanny explains, "The Fouga was a docile aircraft and very nice to fly but it had one vice: spinning. The 'V-tail' was essentially a combined elevator and rudder, two controls that are needed for spin recovery. If you mishandle a spin recovery in a Fouga you get into a fast spin. The spin rate was relatively docile if you handled it normally, but if you got the recovery wrong you went from a rotation every three to four seconds to one of at least twice that rate. There had been a number of Fouga accidents in other air forces as a result of spinning.

> ***"On our wings course we were all almost terrified of going into a spin"***

"As I reflect back to my 50 hours' Fouga training on the wings course, we were all almost terrified of going into a spin, but later on, during the operational conversion course and as instructors with more confidence in the aircraft and in ourselves, we deliberately got ourselves into fast spins to figure out the best instructional method to teach people how to recover from them. We never did fast spins with students, though we did teach them the corrective action should they inadvertently find themselves in such a situation. Initially spin recovery was taught by getting into a spin, doing one rotation and getting out of the spin but if you let the spin develop and do, say, three rotations the student becomes more comfortable in that environment and can work out what corrective action to apply. We would generally enter spins from 20,000ft, do three rotations and recovery, losing about 8,000ft of altitude while doing it."

To illustrate why spinning in a Fouga was approached with a great deal of caution, retired Brig Gen Paul Fry recounts an incident from early in his flying career. "Myles Cassidy and self got into an inverted spin during my 50-hour handling check in 1976, when during the recovery after a three-turn spin I pushed the stick too far forward — and probably too briskly — with the result that we flipped over the top onto our back. Taken by surprise at this development, I left the opposite rudder applied and she remained inverted, flicking into a spin immediately. Round we went and I just sat there trying to figure out what to do next — and all the time losing altitude at a quick rate.

“Myles took it from me and applied the correct recovery action: opposite rudder, stick back to beyond neutral, pause — two, three — and centralise everything as soon as the spin stopped, which it did. We pulled through from the inverted glide that we recovered into, passing through 8,000ft on the way to a zoom climb and rolling off the top of the loop. We had started the first spin at 18,000ft so we had used up a great deal of altitude. Myles gave the aircraft back to me and we climbed back up and repeated the exercise, without the inverted bit, of course. The next time I experienced an inverted spin was in the Super Tucano in 2002, and this time it was by way of a deliberate entry!”

Cdt John Mulvanny in the front seat of a Fouga. He was trained on the type before instructing on it and leading the Silver Swallows team. IAC

The Magister was well-liked by pilots. Nevertheless, there were a few occasions where it caused some heart-stopping moments. Both Cdt Geoffrey O’Byrne-White and Cdt Myles Cassidy experienced double engine flame-outs during take-offs from very wet runways. This was due to the low-slung intakes ingesting water splashed up from the nosewheel. On another occasion, Capt Graeme Martin recalled flying as number two in a three-ship formation led by Capt Martin Duffy at one of the Salthill airshows in Galway when the number three, in the hands of Capt Paddy McNamee, suffered an engine failure at the top of a loop. He broke away and made an emergency landing.

Cassidy once experienced a bird-strike while flying the Fouga, the unfortunate bird having impacted the wing in the vicinity of the airbrakes, jamming them in the open position. The damage from the emergency landing was substantial enough to necessitate a lengthy repair.

> *“ The Fouga’s value as a training tool was diminishing ”*

Potentially the most serious incident occurred on 24 April 1991 when Lt John Finn was required to make a forced landing in a large field near the Whitegate oil refinery in County Cork due to fuel starvation. Fortunately, no serious harm occurred to aircraft or pilot. The aeroplane was recovered by truck the following day and brought back to Baldonnel.

During a low-level two-ship flight over a forest near Nenagh, County Tipperary, the number two experienced severe vibration. The pilot immediately climbed to altitude and after a quick scan of the instruments could find nothing amiss. The fault was soon spotted following an emergency landing at Shannon, however. During some high-g manoeuvring the two air deflectors mounted on both sides of the front canopy frame had deployed. These were designed to create turbulent airflow in the event of the canopies being jettisoned during an emergency, thus aiding crew egress. On this occasion the wire that usually held the air deflectors in the closed position had failed unexpectedly.

There were some lighter moments. Pilots wore parachutes that were connected to the seat harness via a D-ring on the left-hand shoulder strap. It was not uncommon for a weary trainee to forget to disconnect the static line from the seat harness prior to exiting the aircraft, only to have the parachute deploy as the pilot walked away from the jet and reached the full extent of the static line, much to the amusement of those watching.

The Magister was an excellent advanced trainer for its day, but as time wore on it was clear the role could be carried out by more modern machines at a lower cost. It wasn’t just the expense of operating and maintaining a first-generation jet designed more than 40 years previously that counted against keeping the Fouga. Its value as a training tool was diminishing too. As operational types with ‘glass’ cockpits and digital displays came into service, the Fouga, with its traditional analogue instruments and basic navigational aids, could no longer prepare new pilots for the sort of cockpit environment in which they would work. It had been superseded in most other countries and it was clear a successor would have to be found by Ireland as well.

The Silver Swallows display team ceased activities in 1997 but the Fouga remained in the Air Corps inventory for a further two years. The decision was taken to retire the aircraft individually as they became due for a scheduled inspection, and the first to be effectively withdrawn was serial 219, which last flew on 26 November 1996 and was used as a spares source for the remaining five airframes during the 1997 display season. Fouga 215 followed in November 1997, with 216 performing its last flight on 16 December, and 217 and 218 following suit on 26 February and 20 April 1998 respectively. Serial 220 remained active until

June 1999 when it was last flown by Capts Justin Martin and Christian Keegan.

There was never a formal stand-down of the Light Strike Squadron. As the number of aircraft dwindled the personnel were reassigned to other duties. Some of the pilots were posted to the Maritime Squadron and the technical staff took over maintenance of the then-new Pilatus Britten-Norman BN-2T-4S Defender 4000 twin-turboprop surveillance aircraft that was procured for the Garda Air Support Unit in April 1997.

A Defence White Paper published in February 2000 set out the Irish government's medium-term strategy for defence, covering the period up to 2010, based on the evolving national and international security environment. It outlined the defence strategy for all three services. Notwithstanding some lobbying from Air Corps personnel prior to its publication, the document stated, "The generally favourable security climate resulted in the need for a very limited military air capability. To exceed this capability would require a level of investment in personnel, equipment and infrastructure which could not be justified."

The White Paper referred to the pragmatic approach taken by the Air Corps in providing a limited clear-weather ground attack/support capability and airspace control restricted to low level and conditions of favourable visibility, but there was no requirement to exceed this with any new aircraft type purchased. The Department of Defence published the tender for a replacement trainer in 2002 and shortly thereafter the Air Corps shortlisted three types for full evaluation: the Swiss-built Pilatus PC-9, the Brazilian Embraer EMB-314 Super Tucano and the US-manufactured Raytheon T-6A Texan II, based on the PC-9. All three were very good contenders, but eventually the PC-9M was chosen. It has turned out to be an outstanding success for Ireland and is the current mount for the Silver Swallows aerobatic team.

The Fouga has been gone from the Irish Air Corps inventory for more than a quarter of a century, but it's still fondly remembered as a very fine aeroplane. No fewer than 113 pilots obtained their wings during the 24 years it was in service and many others were instructors on the type. It became famous through the Silver Swallows, who reached a pinnacle of achievement by being awarded the Lockheed Martin Cannestra Trophy for the best overseas display at the Royal International Air Tattoo in 1997. And the Fouga's safety record is reason alone for it having a special place in the memory of those who flew and maintained it.

NEXT MONTH...
Our two-part feature concludes with the history of Ireland's Magister-mounted Silver Swallows display team.

IRELAND'S FOUGAS

Construction number	Previous operator, serial	Irish Air Corps serial	Delivery date
357	Austrian Air Force, 4D-YK	215	11 September 1975
358	Austrian Air Force, 4D-YJ	216	11 September 1975
359	Austrian Air Force, 4D-YL	217	16 February 1976
390	Austrian Air Force, 4D-YU	218	16 February 1976
298	Destined for Katanga but did not enter service	219	13 November 1976
299	Destined for Katanga but did not enter service	220	13 November 1976

Baldonnel's Casement Aerodrome provides the backdrop to Fouga 218. IAC

MARS MISSIONS

PHILIPPINE MARS

As the last example to fly goes on show at its final resting place, Martin Mars captain Peter Killin and flight engineer David Millman describe operating the largest Allied flying boat produced for World War Two

WORDS: JAN TEGLER

NAVY
76820
JRM-1
NAVAL AIR TRANSPORT SERVICE
C-FLYK

C-FLYK *Philippine Mars* en route between Sproat Lake, British Columbia and Lake Pleasant, Arizona on 10 February, the last time one of these mighty machines will ever be airborne.
DAVID LEININGER

RIGHT: Peter Killin, the captain of the Mars, enjoys the best seat in the house while taxiing.
DEREK HEYES

Long defunct, DeSoto was a Chrysler car brand positioned as a mid-market marque known chiefly in post-war North America for the sizeable sedans it produced. Well-made and popular through the mid-1950s, the cars were stylish but heavy — and not particularly agile.

Martin JRM Mars captain Peter Killin, the last man in history to pilot one of the huge flying boats, was six years old in 1960 when he first laid eyes on one of the Mars that had been acquired from American aircraft scrappers by a company in British Columbia, Canada called Forest Industries Flying Tankers. The firm repurposed the transports as the world's largest firefighting aeroplanes.

He was also familiar with the DeSotos rolling down the roads in his native Canada in that era. Perhaps that's why when describing the feel of the Martin Mars toting a load in-flight he likens it to the Chrysler-derived sedans.

"The airplane doesn't do anything very fast", Killin remarks. "We have a boosted rudder and that's it. It's like a DeSoto with no power steering. With a load on the airplane feels really heavy."

That's unsurprising given the Mars' mammoth dimensions. At 38 and-a-half feet tall with a 200ft wingspan, a 13ft 6in beam and 117ft long nose-to-tail, the Glenn L. Martin Company design had an empty weight of more than 75,000lb in wartime trim as a cargo/personnel-carrying transport.

Originally intended as a long-range ocean patrol bomber able to cover large swathes of the Pacific, its mission was shifted in 1943 after delivery of the prototype XPB2M-1 Mars to the US Navy. Thereafter, it was considered most useful as a heavy hauler. But World War Two was almost at an end in June 1945 when the first production Mars was handed over.

The navy had ordered 20 JRM-1 Mars, but with the war winding down, the service opted to purchase only the five aircraft making their way along Martin's production line in the summer

BELOW: The arid Arizona landscape seems rather an incongruous backdrop for *Philippine Mars* as it undertakes its final flying journey.
DAVID LEININGER

NAVAL AIR TRANSPORT SERVICE
PHILIPPINE MARS

In its long-time Sproat Lake habitat last December, as taxiing trials proceed following several years of inactivity.
DEREK HEYES

> *“The airplane doesn’t do anything very fast. We have a boosted rudder and that’s it. With a load on it feels really heavy”*

ABOVE: Landings, as here at Sproat Lake, were always made with full flap.
DEREK HEYES

of 1945. All told, just seven of the massive seaplanes were built.

From 1945-55, the Mars shuttled navy personnel and equipment to Pacific naval bases, primarily between their home station, NAS Alameda in San Francisco, California and Honolulu, Hawaii. Scores of sailors, soldiers, marines and airmen wounded during the Korean War were transported back to the US on the Mars fleet.

Conversion of the four Mars acquired by Forest Industries Flying Tankers in 1959 to firebombers included the addition of several water tanks in the fuselage and two retractable pick-up scoops that could rapidly fill the tanks with 7,200 gallons of water. Water drops were made via 22 doors in the aircraft's hull.

Killin flew *Philippine Mars* and *Hawaii Mars* extensively on firefighting missions. Flight engineer David Millman crewed on *Hawaii Mars* primarily during those days but like Killin, he made the last flights with *Philippine Mars*.

The aircraft were equipped with four 24WA-series versions of Wright's R-3350 radial engine capable of producing up to 2,500hp apiece. The 24WAs were not fitted with the power recovery turbines that later 'turbo-compound' '3350s had, boosting output closer to 3,000hp. One distinction the firebomber Mars had was reversible propellers on its number two and three engines to give aircrew more control to manoeuvre on the water.

◆

Piloting the largest flying boat produced during World War Two was an exercise in teamwork, both in the air and on the water. This both Peter Killin and David Millman stress, particularly when operating in the aerial firefighting role the aircraft assumed for nearly 60 years after a decade in US Navy service.

"Pre-flight and post-flight inspections were by boat of course, not on foot", Millman explains. "One engineer would enter the aircraft before a mission to do pre-flight while a second would do the external pre-flight with a boat. Instead of a walk-around, we called it a 'boat-around.'"

Bringing the Mars' four R-3350s to life involved extra considerations beyond those for land-based aircraft that utilised the same engines, Killin notes. "Depending on where the airplane is pointed and where it is in relation to the mooring buoy you vary the start procedure. If the wind's blowing, the airplane hangs straight off the end of its lines downwind. But if it's calm sometimes the airplane will drift around. So I'd have to start either number two or number three first to gain control of 160,000lb-worth of airplane."

Killin would select which engine to start first by determining which radial would push the Mars' nose away from its mooring buoy.

"If I've got the buoy sitting at 11 o'clock off the nose, I would start engine number two which will push the nose farther away from the buoy. Like, I'd call for a pre-start check to Dave [Millman] and he'd ask me for the starting order. I'd say, 'two, three, one and four'. Or 'two, three, four and one'. It just depends on the position of the airplane to help gain control of it."

Despite the Mars' size and the considerable sail area of its relatively slab-like sides and vertical stabiliser, Killin says taxing the aeroplane on the water was relatively straightforward. "I've got 10,000hp that says I can go anywhere I want", he quips. "You just steer it like you're going fishing."

Boaters on Sproat Lake, British Columbia, where the two flying boats were based, became very familiar with them when they were operated by Coulson Aviation and knew how to give the aircraft plenty of space when taking off or landing. That made operations on the water easier.

As in all evolutions with the Mars, smooth crew co-ordination was required for take-off. Once in position, engine run-ups were done with the need to keep the aircraft's nose from weather-cocking. "You'd go through balanced run-ups", Killin explains. "You'd do engines one and four or two and three so it was always balanced to maintain a straight line on the water.

"With the run-ups done we'd go through the pre-take-off checklist. Then I'd usually pass the power back to the engineer. I'll push the throttles up through 40in of manifold — max power is 54in of manifold pressure. I'd just say, 'Pilot to engineer, you have the power'. He then pushed it up to full power."

With 51 years of experience as a military and civilian flight engineer in everything from the turbo-compound R-3350-powered Canadair CP-107 Argus maritime patrol aircraft, derived from the Bristol Britannia airliner, which the Canadian Forces operated in the 1960s and 1970s to the Boeing 747s he flew with Japan Airlines, Millman was well-suited to become a lead engineer for *Hawaii Mars.*

> **"On the water, you just steer it like you're going fishing"**

"I was pretty excited about it because it gave me the kind of control like what an old-time flight engineer used to do", Millman says. "From the time the pilot calls for take-off power on the water to the time you return to land on the water, the flight engineer handles the power. For instance, going in for a drop they'd say, 'maintain 120 or 110kt'. That's what you did and I felt quite confident doing that because it brought back the old days. The pilots are committed to looking where they're going, lining up on a fire. They just left the power and speed to the flight engineer. It was right up my alley. I really felt a part of the flight crew.

"Take-off power was 54in and 2,400rpm. You set the numbers and away you go. As the flight engineer sitting back there, you have control of everything except for keeping the wings level. The pilots don't even have indication of an engine fire. That's indicated at the flight engineer's station and you have to advise the pilots. It was a very responsible job."

"The airplane came up out of the water and onto the step at about 60kt", Killin recounts. "And you were airborne at 84kt — not 83 or 85, 84. It's that specific."

Killin says the Mars would climb at 700 to 800ft per minute unloaded, roughly equivalent to a Cessna 172. With a load of water and foam retardant, the climb rate dropped drastically to about 150ft per minute. He mentions unloaded and loaded rates of climb together because the Mars would often take off, then immediately circle around and touch back down on the water to scoop water into its tanks heading for fires.

"There are two gross weights that we had to deal with", he explains. "On the water at take-off those engines will pull the airplane up on the step and lift off at 148,000lb. But our all-up weight is 162,000lb. So there's 14,000lb more of disposable load [water] we can take on.

"We'd take off and then come around back onto the water and do a scoop. Full flaps over

With its tail rising some 38.5ft tall, the Mars seems almost to be a monument to the ultimate age of the flying boat. DEREK HEYES

PHILIPPINE MARS

RIGHT: ***Philippine Mars* was BuNo 76820 with the US Navy, and wears the badge of the Naval Air Transport Service on its nose. On delivery in 1946 it was assigned to transport squadron VR-2, headquartered at NAS Alameda, California.** DEREK HEYES

the fence, touch down, slow the airplane to 70kt with flaps up. Then I'd make the call. 'Engineer, pilot, you have the power. Scoops are going down now'. That was his cue to go to 54in, full power.

"When those scoops are down he'd start a timer, a digital clock. The numbers are easy to deal with. Typically we would go off the buoy [unloaded] at 122,000lb. So that's 40,000lb that can be loaded. At 65kt the airplane loads a ton per second of water. Twenty seconds is 40,000lb. We always liked to have five miles to load and climb out."

◆

Due to the age of *Philippine Mars* and *Hawaii Mars*, the aircraft were flown within limits. "We were limited to 150kt and we'd be down under 30in of manifold pressure to stay at that speed", Killin says. "Typically we'd still be in cruise at about 155 or 160kt."

Even with the avionics upgrades to *Hawaii Mars* including GPS guidance and synthetic vision systems, this was a day-only aircraft. Altitudes flown to and from fires depended on the terrain it had to overfly to reach its targets.

Once in the local area around a fire with a load of water aboard, the Mars felt weighty and required its pilots and engineers to think ahead. But it could be manoeuvred with surprising agility. According to Killin, "When you slow to 120kt and put the flaps at 20° [on a drop] you can turn it quite nicely. And that's

RIGHT: On approach to Lake Pleasant, where the airframe was dismantled for road transportation to Pima. DAVID LEININGER

LEFT:
The last Mars flight included an escort by PB4Y-2 Privateer N2871G — another unique airworthy specimen — and P-51D Mustang N44727 *Man-O-War*. Engine problems on *Philippine Mars* had seen it divert back into Sproat Lake on 3 December last year, and the replacement of the troublesome R-3350 powerplant with one taken off its Coulson sister-ship, C-FLYL *Hawaii Mars*, which had been delivered to the British Columbia Air Museum the previous August. In all, four engine changes proved necessary.
DAVID LEININGER

where you're manoeuvring, getting the airplane on-target.

"You need lots of trim. We had a great big trim wheel. But when you executed a drop you'd leave the trim alone. You'd just push the nose down into the drop. Otherwise the airplane would pitch up on you. The flight engineers always had to go to full power after the drop.

"Our limitations were the flap speeds. So, flaps 10 is 120kt. Flaps 15 is 105, and under 100kt I could go flaps 30 or 40. An undesirable setting is flaps 30 because it causes a lot of stress on the flight control cables, push tubes and stuff."

Killin likens firefighting with the Mars to flying in combat. "There's nothing like dropping down on a fire with turbulence, low visibility and smoke. When you get into the wildfire environment, if you've ever flown in hail, you know how it bounces off the windshield? I did that daily in the Mars, going down on a fire with twigs and branches flying up in the heated columns of air and hitting the windshield like hail. Just craziness! And lots of turbulence.

"The airplane weighs 162,000lb heading down on a fire. Down in Mexico we were dropping at 5,400ft above sea level but our density altitudes were up over 9,000ft. So there's not much airplane there when it's fully loaded. It might climb at 100ft per minute when we get up high."

"I always did a full-flap landing but never a 30° landing", Killin adds. "I knew where I wanted to be for power, at what height I wanted to be landing back at the lake. You'd start slowing up on downwind, pull the nose up and turn base. If I was under 120kt, I could go right to flaps 20. That makes the airplane a little more manoeuvrable.

"Down close to the water it could float if you had excess air speed. But I'd just pull her back to 30in to slow down, then 25in over the fence and bring her down to the water. I didn't flare to a climbing attitude. I flared to a level attitude. Then I'd have the power and I could either add power or take power off. I let the energy bleed off. I wanted a 100ft-per-minute descent and when you made contact with the water you didn't even feel it.

◆

"On the water the nose comes up and when it slows enough the airplane flops over on one wing [outrigger float]. The first thing I'd do is turn off the prop reverse safety switch. I'd open that circuit up so that if I needed reverse I could select it.

"Approaching the buoy to park the airplane, I didn't want anybody around me — no boats, nothing. I'd select reverse on number two and three engines. That slowed the airplane's momentum as we taxied. I referenced my GPS for taxiing at about 3kt, coming up on the buoy. I could arrest the forward inertia with two and three by going from 900 to 1,000rpm, sometimes a bit more. If the nose was way off-centre to the buoy I could tweak it with number one or four and that gave a big push in either direction, swinging the wing back in toward the buoy. You really had to master that whole event."

A series of test flights, multiple engine changes and three attempts — including one during which *Philippine Mars'* number-four R-3350 blew a cylinder and shot flames described as measuring 6-8ft out in front of the engine — between December 2024 and early February 2025 were needed in order to get the last airworthy Mars from Sproat Lake all the way down to Lake Pleasant, Arizona. Prior to the trip, it hadn't flown for 17 years and required extensive work beginning in April 2024 to get it back into the air again.

"I think you have to give credit to the maintenance people at Coulson Aviation for maintaining those airplanes for all those years and preserving them so that they could still fly", Millman says. "I'm 78 years old and it was hard work for this old guy, but I'm very glad I did it."

"I pinch myself every day when I think about what I just did by closing the history books on both of those airplanes", Killin concludes. "We got the *Philippine Mars* to Arizona successfully and that was a tall order."

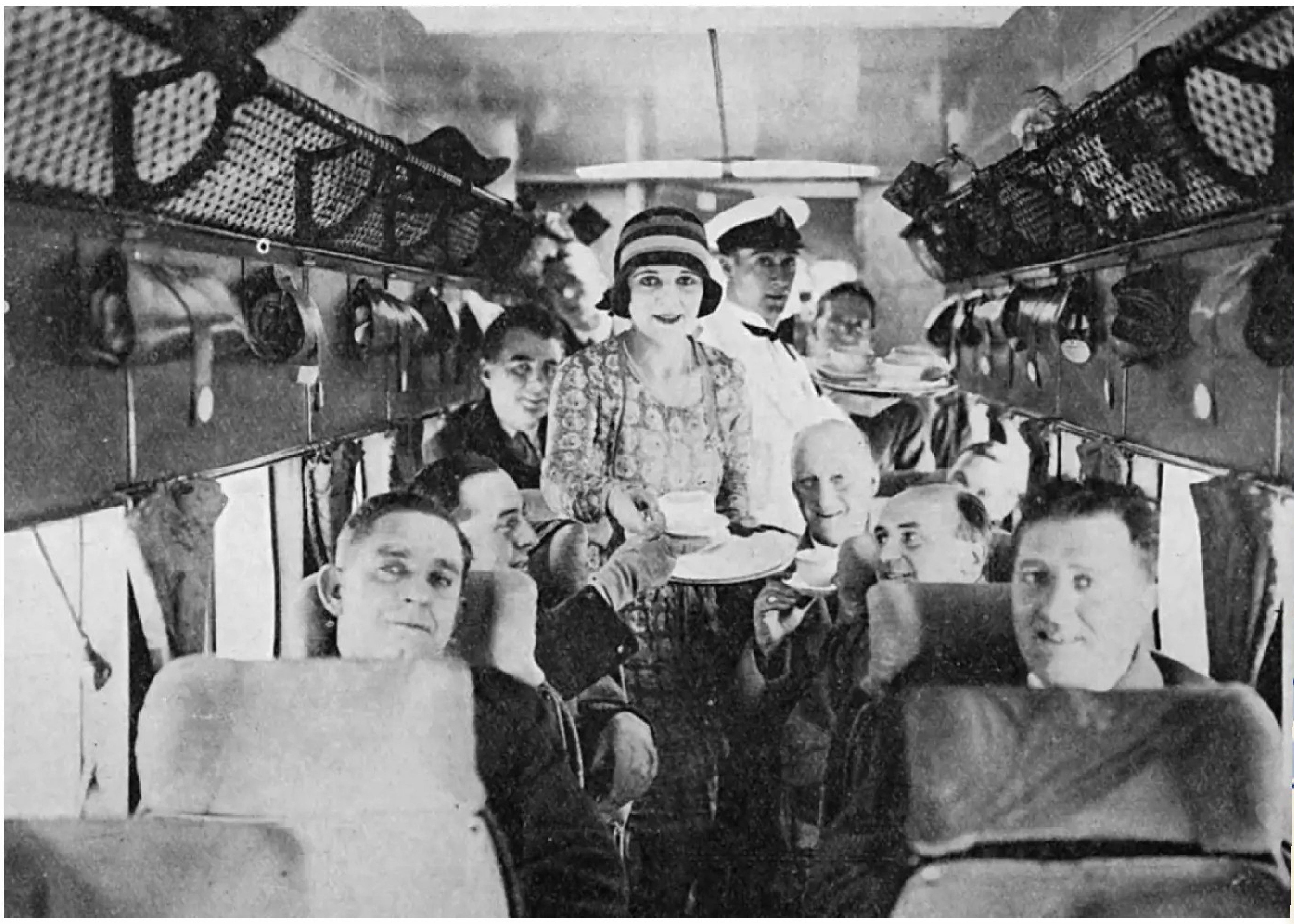
Following the final flight the aircraft was partially disassembled and trucked 160 miles to Tucson where it now rests, having undergone the painstaking process of reassembly at the Pima Air and Space Museum.

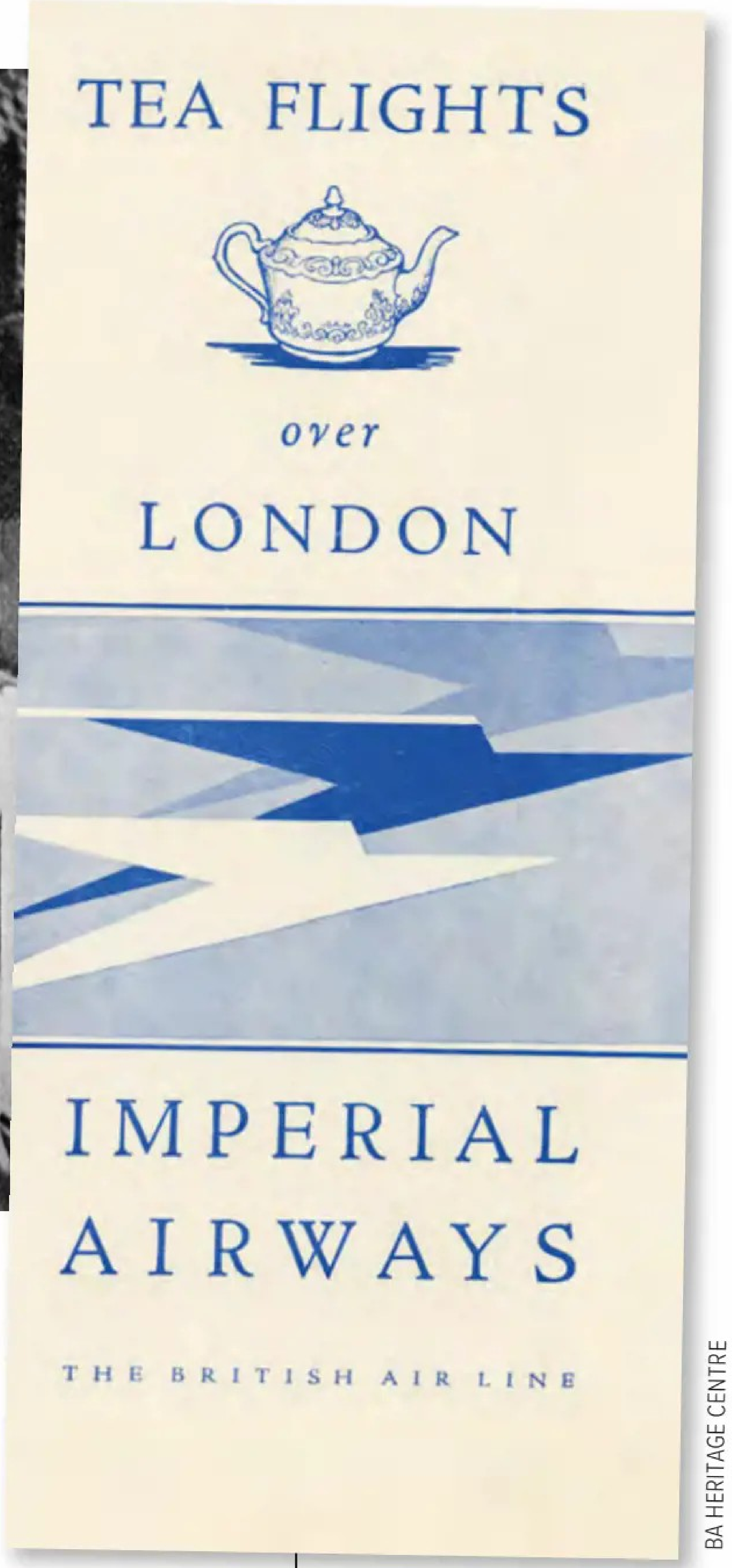
BUSINESS and PLEASURE

Imperial Airways is rightly remembered for its pioneering routes to Africa, Asia, Australia and the Americas, but closer to home it developed a thriving business in what it dubbed 'Charter and Special Flights' — involving everything from afternoon tea to transporting animals

WORDS: DAVID RANSTED

HERACLES
IMPERIAL AIRWAYS





TEA FLIGHTS

over

LONDON

IMPERIAL AIRWAYS

THE BRITISH AIR LINE

BA HERITAGE CENTRE

The most popular of Imperial Airways' innovative 'special flights' were its Tea Flights. From Croydon airport the trips, by Armstrong Whitworth Argosy, flew north over south London to the Thames, giving passengers a bird's eye view of the Houses of Parliament, Tower Bridge, the Tower of London and St Paul's Cathedral, among the many landmarks. Afternoon tea was served during the 30-minute cruise and passengers were invited to round off their experience with a guided tour of the airport on landing back at Croydon. Should visibility be poor, Imperial promised a flight over the upper or lower reaches of the Thames instead.

The flights were an instant hit with the public. Imperial Airways' staff newsletter published one passenger's enthusiastic account: "The 'Tea Flights' which last summer won a decided popularity as being the most unique, and certainly the most delightful, manner of taking one's afternoon tea, have this year given indications of being as much of an institution as 'Church Parade' in Hyde Park. The visitor from the States finds his way to Croydon nowadays as quickly as to Westminster Abbey or Windsor Castle, for the opportunity of being served with afternoon tea while cruising leisurely above the world's greatest city is something too good to be passed over lightly.

"The machines used are the multi-engined Silver Wing de Luxe air liners of the Imperial Liners — the last word, in fact, in passenger-carrying aeroplanes. The experience is wholly delightful. A hurricane rush across the aerodrome, and gently, almost imperceptibly, the giant plane lifts, revealing a miniature world of extraordinary neatness below. In a moment you are heading for London, and with a cup of tea and biscuits on your lap, served in true 'restaurant' style by a steward, are enjoying the inexhaustible game of picking out familiar landmarks. There, a green lozenge, and very small, is Kennington Oval; and on the left, the long silver serpent of the river, spanned by its bridges from Battersea to the Tower. Big Ben has the stature of a pin, and the sight of a microscopic traffic block gives one a glow of triumph when flying untrammelled at ninety miles per hour.

"At length you turn, and with a swiftness that fills you with regret, the Air Port appears far below, small as a tennis court, but increasing by leaps and bounds as you plane downwards to a landing that borders on tameness."

In 1930 the Tea Flights — flying at 2,000ft and airborne for around 45 minutes — took place every Friday, Saturday and Sunday afternoon throughout the summer. The fare was £2 2s, almost half the weekly wage of a skilled worker in the UK at the time and around £117 in today's money, including car transfer between Airways House in London and Croydon airport, cars leaving at 14.30hrs for a 15.15 departure.

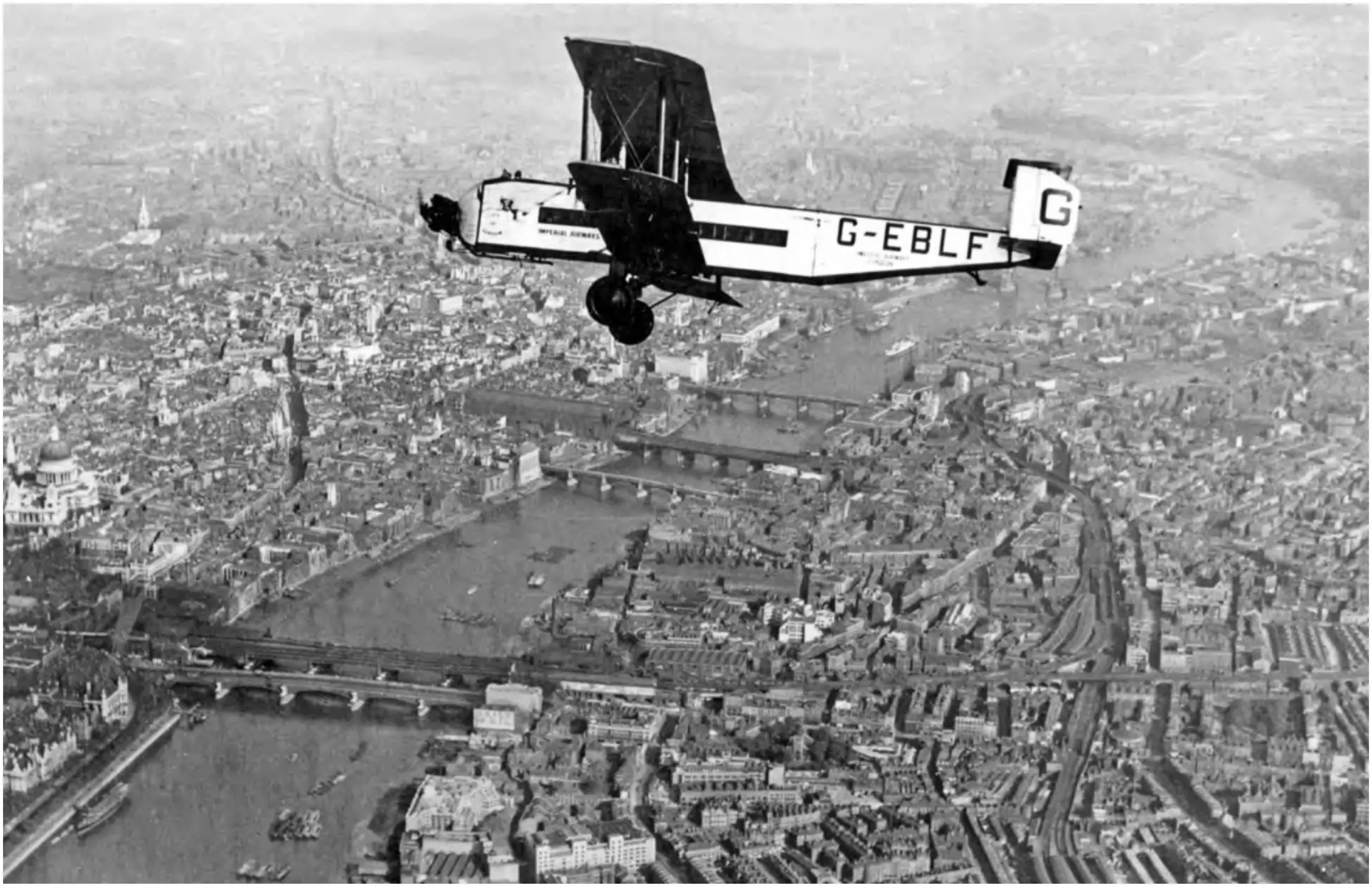
For 1931 the fare was reduced to £1 10s and flights operated on Friday and Sunday from 12 June until 27 September. The popularity of the Tea Flights saw the 1932 season extended from 17 April until 30 October, although they had originally been planned to continue on Sundays right up to Christmas. Imperial announced in March 1933 that, with such great demand for its aircraft on weekend scheduled duties, the Tea Flights would not go ahead that year, although they would return later.

These operations did a fine job in increasing airmindedness. And with their success, Imperial began sightseeing flights to observe the Boat Race, the Argosy airliners circling above the route to afford a commanding view of the entire course for a fare of £2 2s encompassing the car transfer between Airways House and Croydon airport.

From a height of 2,000ft — low enough for those on board to discern the teams' different-coloured oars — the pilot was in ➤

TOP: Afternoon tea was served by a steward "while cruising leisurely above the world's greatest city... in true restaurant style."
ALAMY

OPPOSITE: Jack Hylton used Imperial Airways several times to transport his eponymous band, but 29 August 1933 was a special occasion. They boarded HP45 G-AAXC *Heracles* at Croydon and performed during the flight, their music being transmitted to a General Post Office exhibition being held in London's Strand.
GETTY



ABOVE: Armstrong Whitworth Argosy G-EBLF *City of Glasgow* banks over the River Thames towards St Paul's Cathedral. This first example of the type was used latterly for joyrides alone. BA HERITAGE CENTRE

constant touch with the progress of the race. For the 1931 edition the Argosy was fitted with a special receiver at the front of the cabin enabling passengers to hear the BBC's commentary, "as if they were following the crews in a launch as well as see it from above the crowds". They would be back in central London just 50 minutes after the end of the contest.

The larger Handley Page HP42s were enlisted for Boat Race duties in 1933, the company boasting, "By far the most satisfactory way of seeing the University Boat Race is from an armchair seat in one of Imperial Airways' air-liners of the *Heracles* class. You are not only more comfortable than you can be in any other point of vantage, but you also have an excellent view of the whole race. The air-liner follows the boats, you watch the whole contest and are in at the finish. You are not jostled and nobody can obscure your view at the critical moment!"

> *"Imperial started a summer season of weekend sojourns"*

Gaining a taste for pleasure charters, Imperial began day-trips to Liverpool's Speke aerodrome for Grand National racegoers at nearby Aintree. The fare of £8 8s took in car transport to and from Croydon as well as entrance to the reserved carriage enclosure at the racecourse. The Grand National outings were in such high demand that in 1933 Imperial used *Heracles* class aircraft — the Handley Page HP45, sometimes referred to as the HP42W — for the purpose, a cold buffet lunch being served on the outbound leg and tea on the return.

The Aintree sorties produced one notable incident: on 25 March 1926 Imperial despatched two four-passenger de Havilland DH50s, G-EBFP and G-EBKZ, filled with eager racegoers, flying in company from Croydon. In "very thick" weather north-west of London G-EBFP, piloted by Capt Rogers, experienced a "violent blow" on the propeller, causing excessive vibration and forcing Rogers to land at Cricklewood to investigate. Damage to the propeller showed it had been struck by an object in the air. On arrival the pilot of G-EBKZ reported his aircraft had lost its aerial weight, which had been trailed behind the aeroplane, and it was deduced that Rogers' DH50 must have flown into 'KZ's aerial.

By the end of 1933 Imperial Airways had taken 11,103 passengers on 'Short Pleasure Flights' during the year, more than double the number carried on its long-haul Empire services and a huge increase over the 6,620 conveyed in 1931 and 6,432 in 1932 on 'Charters and short flights'. This number dropped significantly in 1934 as the fleet was more fully engaged in scheduled services, with only 4,191 in that year. In its annual report for 1934, Imperial stated, "We supplied certain older aircraft to other operators for these short pleasure flights, which have played a useful part in encouraging the growth of air travel."

Imperial inaugurated a summer season of weekend sojourns by 'air

IMPERIAL AIRWAYS
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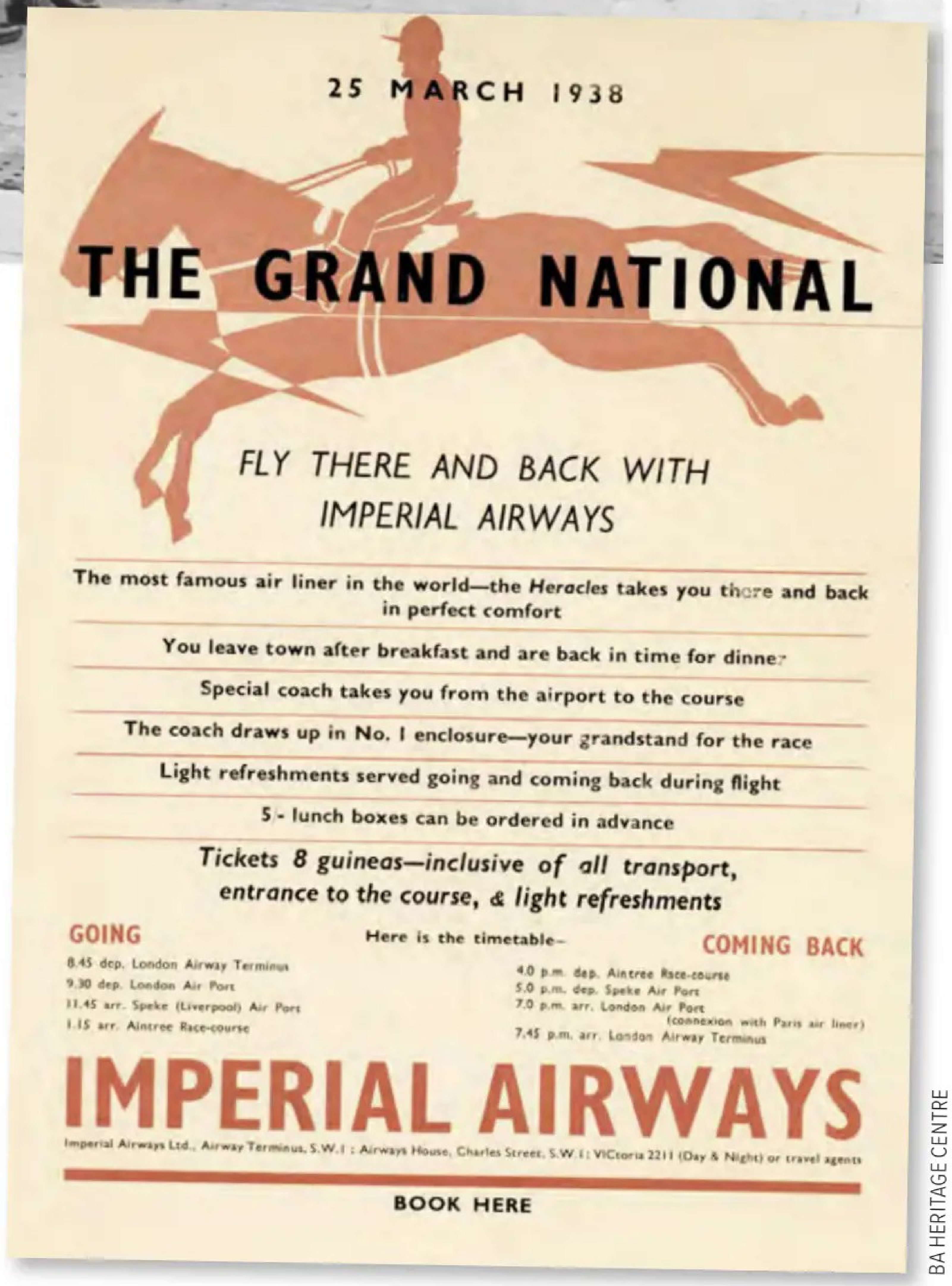
On 23 March 1934, passengers at Croydon board *Heracles* for a flight to Liverpool in order to watch the Grand National. They saw 8/1-shot Golden Miller take victory. GETTY


25 MARCH 1938

THE GRAND NATIONAL

FLY THERE AND BACK WITH
IMPERIAL AIRWAYS

The most famous air liner in the world—the *Heracles* takes you there and back in perfect comfort

You leave town after breakfast and are back in time for dinner

Special coach takes you from the airport to the course

The coach draws up in No. 1 enclosure—your grandstand for the race

Light refreshments served going and coming back during flight

5/- lunch boxes can be ordered in advance

Tickets 8 guineas—inclusive of all transport, entrance to the course, & light refreshments

Here is the timetable–

GOING

8.45 dep. London Airway Terminus
9.30 dep. London Air Port
11.45 arr. Speke (Liverpool) Air Port
1.15 arr. Aintree Race-course

COMING BACK

4.0 p.m. dep. Aintree Race-course
5.0 p.m. dep. Speke Air Port
7.0 p.m. arr. London Air Port
(connexion with Paris air liner)
7.45 p.m. arr. London Airway Terminus

IMPERIAL AIRWAYS

Imperial Airways Ltd., Airway Terminus, S.W.1 : Airways House, Charles Street, S.W.1 : VICtoria 2211 (Day & Night) or travel agents

BOOK HERE

BA HERITAGE CENTRE

taxi' to the French resort of Le Touquet on the Channel coast — famed for its casinos, horse racing and beaches — operating from Croydon to Berck aerodrome. The flight lasted one hour, at 101 miles the shortest international route on Imperial's network, and passengers could be in the resort just half an hour later. Aircraft seating from one to four passengers were able to be chartered during daylight hours and return flights to London arranged in advance or via any Le Touquet hotel porter. Charter rates were set at £12 10s for a single passenger up to £25 for four.

Warming to the theme of encouraging the public to take to the air, as well as weekend excursions, in 1933 the company introduced Sunday day-trips to Le Touquet for a fare of £3 15s — the normal price of a one-way ticket on the route — which took in a four-course meal on the evening return flight. An advantage for passengers booking these day-trips was that passports were not required for British, French or Belgian citizens. Such was the popularity that in 1933 Imperial initiated a Le Touquet stop 'upon request' on its Sunday afternoon outbound Paris service and its evening Paris-London flight. Come 1935, Le Touquet had become a daily scheduled route.

Seeing a ready clientele among visitors to the air pageants of the day, Imperial provided many with their aerial baptisms. In June 1928 alone over 3,000 passengers were carried on short flights, Capt O. P. Jones flying more than 2,000 in two days of pleasure flights from Glasgow in Argosy *City of Glasgow*. It made in excess of 100 'hops', the aircraft performing faultlessly.

◆

Two of the carrier's Handley Page machines flew the following month to the Blackpool Air Pageant, where they carried more than 2,300 passengers. Imperial's board concluded, "There is no doubt that when our aircraft can be spared for organised meetings, short pleasure flights are very popular with the public."

Imperial's special charters during April-May 1930 accounted for 12,195 miles of flying, including three days operating from Glasgow during the Scottish Flying Club's Flying Weekend, which attracted 3,116 passengers. Once again they went aboard Argosy *City of Glasgow*, piloted by Jones. On the flight from Croydon the aircraft carried Prime Minister Ramsay MacDonald, a known aviation enthusiast. This feat was repeated when in May 1932 HP45 *Heracles* was flown by Jones to Renfrew for the same club's three-day Annual Pageant.

For the Schneider Trophy in August 1931, Imperial operated a charter by Argosy to Portsmouth, the 20 passengers being taken from Portsmouth aerodrome to accommodation at Southsea Pier to witness the competition. The weather was so bad the race was cancelled and the return flight had to alight at Shoreham, from where the party returned by road. Several hundred football supporters, in London to attend the FA Cup Final between Newcastle United and Arsenal on 23 April 1932, spent the Saturday morning visiting Croydon, and all available aircraft were kept busy with joyrides.

In addition to many excursions transporting competitors and fans to sporting events, the company undertook some racing of its own. It ran a trial during the summer of 1928 with an Avro Avian carrying London evening papers to Bournemouth in an attempt to beat the train, while in 1929 and again in 1932 an Argosy raced LNER's *Flying Scotsman* from London to Edinburgh, creating nationwide interest. For the 1932 event a transmitting and receiving device was installed in the train to enable conversations between the aircraft and train passengers en route, to be broadcast by the BBC.

Six aircraft were chartered — although one was unserviceable — to take parties aloft to view June 1927's total solar eclipse, but Imperial quickly became adept at arranging more ambitious charters and special flights. In March 1928 it advertised an epic, 35-day 'Air Cruise' of France, Spain, North Africa and Italy. The 25-stop tour, inclusive of flights, ground transport and hotel accommodation, cost 435 guineas — £24,455 today.

Charter business was actively sought out on top of pleasure flying. During 1931 Imperial teamed up with the Southern Railway to provide cheap excursion fares for parties travelling into London by train. For an extra 7s on top of their rail fare, passengers could visit Croydon airport and experience a short flight in one of Imperial's "cross-Channel liners".

One special charter in 1928 saw a Handley Page W10 being flown by Capt Armstrong to Paris, Cologne, Berlin, Prague, Vienna, Budapest, Munich, Basel and back to London, a 2,310-mile routing. Armstrong was again in charge for a DH50 special charter over a 6,500-mile tour of France, Spain and Morocco, while in February 1935 Short Scilla *Syrinx* was hired by the Iraq Petroleum Company for a trip to Baghdad for the opening ceremonies of the pipeline between Iraq and the Mediterranean.

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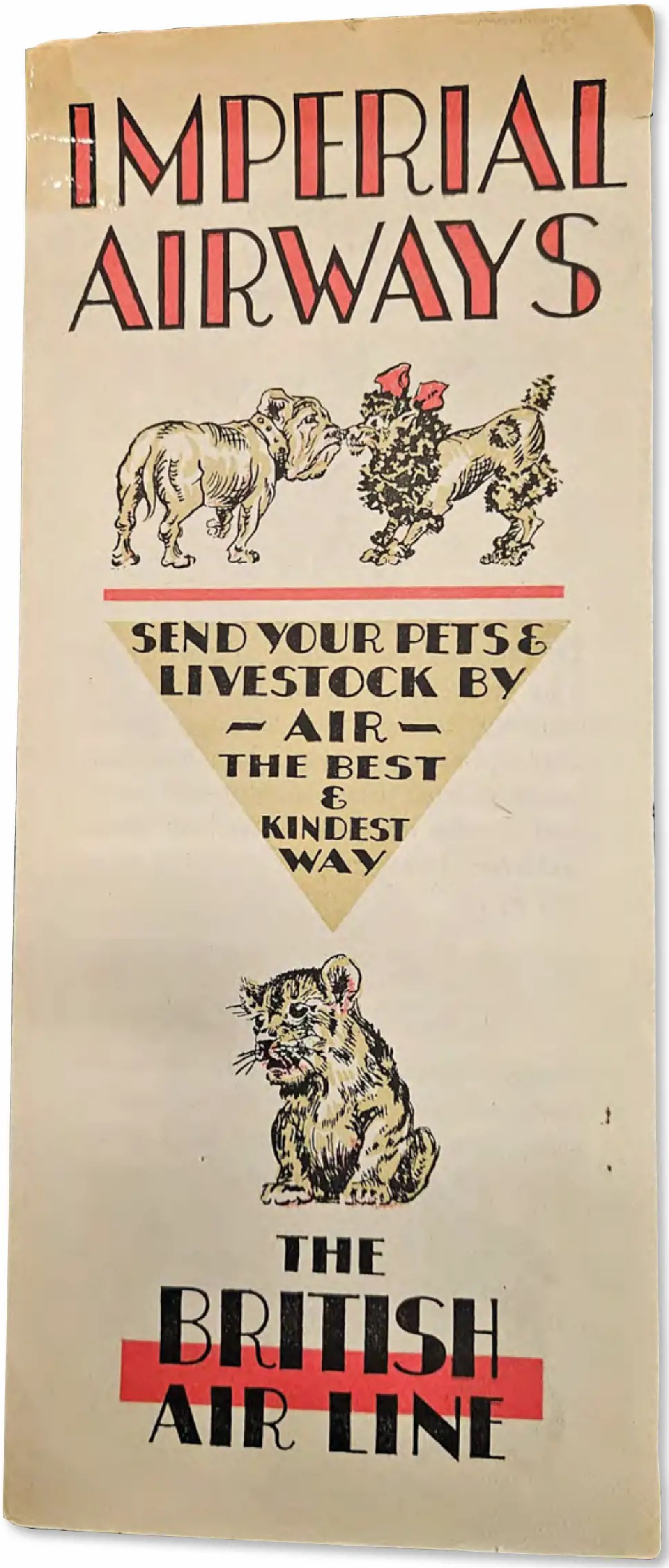
Imperial gained significant publicity in its airmindedness drive from carrying famous people, and the British and foreign royal families were frequent patrons. On 13 August 1932 the Prince of Wales and Prince George flew from Venice to Corfu via Brindisi to join the Royal Navy's Mediterranean Fleet aboard the Short Kent flying boat *Satyrus*, and Imperial made a 7,000-mile round-trip to Khartoum for the King of the Belgians.

HP42 *Hannibal* carried a party of VIPs including Sir Malcolm Campbell over London in June 1931, and that October the British & Dominion Film Company chartered sister-ship *Hanno* for half an hour to obtain shots from the air. On 24 April 1932 Jack Hylton used *Horatius* to take his orchestra to Brussels for a concert, while in June a DH50 transported actress Benita Hume to Middlesbrough for a film shoot for the movie *Men of Steel*, returning her to London the same day in time for her evening West End theatre performance. *Heracles* ferried a party of drama critics to Cheltenham in July for the first production at the Malvern Festival of George Bernard Shaw's play *Too Good to be True*, making several pleasure flights from the Gloucestershire town.

During June 1932 a charter by *Heracles* was made to Blackpool for the Lord Mayor of London and his entourage, the entire party bedecked in official robes, to mark the opening of Morecambe town hall. Many charters were conducted for government ministers and airmindedness was further encouraged by taking travel agents on familiarisation flights.


IMPERIAL AIRWAYS
SEND YOUR PETS & LIVESTOCK BY — AIR — THE BEST & KINDEST WAY
THE BRITISH AIR LINE

BA HERITAGE CENTRE

It didn't always go according to plan. Pilot Gordon Olley, flying a specially chartered Vickers Vulcan to Saint-Inglevert near Boulogne in April 1928 was unable to land as the airport was in cloud, alighting instead in a field, from where he flew his inbound passengers

Wireless headsets in use on an Imperial charter to allow the passengers to hear the BBC's commentary on the 1934 Epsom Derby. GETTY

IMPERIAL'S AIR AMBULANCES

In December 1934, HP45 *Heracles* was converted into a flying hospital with doctors, nurses, a stretcher and a variety of sitting and walking 'patients'. The experiment, by the British Red Cross Society Flying Branch, demonstrated the carriage of urgent medical cases from outlying areas to the central London hospitals and of medical treatment while in flight.

So successful was it that Imperial became adept at adapting its airliners for air ambulance work. One patient was carried by chartered air ambulance to Zurich for specialist treatment when a journey by train and boat would have been too much for him; another was taken 7,000 miles from Africa to London, accompanied by a doctor, a special bed replacing the seats and tables in one of the aircraft's saloons. A further passenger, with a serious spinal injury that meant any sudden movement was a risk to his life, was conveyed to the continent by Imperial airliner in a bed slung on shock-absorbing springs, accompanied by a doctor and nurse. He too was successfully treated.

Earlier, in June 1932, Imperial had dispatched a Westland commanded by Capt Olley to Jersey with two doctors to perform an operation on a child. Olley landed in France awaiting low tide so the aircraft could land on the beach at Jersey.

IMPERIAL AIRWAYS

In December 1934, *Heracles* is used for an experiment by the British Red Cross Flying Branch to evaluate the feasibility of using airliners to convey sick passengers and for medical treatment in flight. RED CROSS

Bristol Jupiter XIF engines running, the hard-working *Heracles* sits behind a tour group on a charter visit to Switzerland. ETH-BIBLIOTHEK ZÜRICH

back to Croydon. On another occasion the pilot's map on a DH50 engaged in a special charter to Brussels fell from his seat and couldn't be retrieved. In the approaching darkness and unable to gain a response to wireless calls, he overshot Brussels by 40 miles and landed. Off-airport landings were not uncommon in the early days: in June 1931 a charter from Croydon to Berck was forced to touch down on the beach at Calais due to dense fog.

Separately, an Imperial airliner embarked on a 5,000-mile foray around Britain for Aviation Tours, providing air experience flights in many major cities for an estimated 10,000 passengers. As ad hoc and air taxi demand grew, during one week of September 1932 Olley alone undertook seven special charters.

The importance of this business is underlined by the fact that in June and July 1932 Imperial's European Division operated no fewer than 161 special charters and 111 short flights, although this included extra rotations on existing scheduled routes. The company created a Special Charter Department to handle the demand.

By 1926 Imperial's trio of two DH50s and single Vickers Vulcan, the only single-engine aircraft in its 16-strong fleet, were considered more appropriate for many air taxi and special charter trips than the larger multi-engine types. The carrier's technical committee later recommended the purchase of an Avro X for special charters in Europe and a Westland Wessex was procured for charter work, such as a contract with the Great Western Railway between Cardiff and Plymouth via Haldon near Teignmouth (later substituted for Torquay), affording passengers a short-cut across the Bristol Channel.

The air taxi concept was put to good use when in 1931 the president of General Motors, J. D. Mooney, received a cable in New York saying his son was gravely ill in a nursing home in Guildford, Surrey. Mooney set sail in the liner *Olympic*, from which, 10 miles south-west of Eddystone, he was lowered into a fast motorboat. At Plymouth he transferred to the Imperial aircraft for the short hop to Farnborough, allowing him to reach his son's bedside and saving around 24 hours.

> *"Imperial had a crucial role in improving awareness of aviation"*

Ad hoc charters included one for the Air Ministry in 1931, using HP45 *Heracles* to carry out night-time tests on the Adcock direction-finding system installed at Pulham and to make observations of beacons and coastal lighthouses between Croydon and Gravelines on the French coast, among them the new beacon at Merstham. This sortie afforded Imperial the opportunity to trial the night-flying qualities of the type and a landing was made at Lympne to test that airfield's new floodlight. Both the Adcock and *Heracles* checked out well, the aircraft being deemed "an excellent type for night flying" despite the foggy conditions. Another nocturnal charter for the Air Ministry in 1931 saw an Argosy being used to assess the air lights between Croydon and the Kent coast, the marine lights on the coast, and for several landings at Croydon under various floodlighting conditions.

Not all special charters were for passengers: in 1926 Imperial undertook flights from Croydon to 19 UK cities and Dublin carrying newspapers during the General Strike. One of these, a 15-minute hop to Brighton on 16 May with DH50 G-EBKZ piloted by Capt Dismore, resulted in a prang when the port radius rod of the chassis collapsed after a "quite normal" landing. It was thought the rod had become overstressed as this aircraft had been used throughout the strike period, "landing in fields not recognised as aerodromes."

Cargo charters ranged from taking Epsom Derby press photos to Paris in June 1926 to transporting a tiger from Ostend for the Olympia Annual Circus in December 1931, while the general election of 1931 saw five aircraft carrying newspapers to UK cities. Olley flew a DH50 to Lisbon with a load of wireless transmitting valves, the 1,250-mile trip taking 15 flying hours with six refuelling and customs stops. The entire journey lasted one-and-a-half days, including a delay in Madrid for the Labour Day celebrations, forcing Olley to walk 15 miles to the aerodrome. HP42 *Helena*, flown by Capt Walters, went to Dublin in July 1932 — it was the largest airliner to have visited the airport — and an Argosy was piloted by Olley to Belfast, both in connection with the War Loan Treasury Conversion.

By 1936 the Tea Flights and other charters and special flights had become a lucrative line for Imperial, whether meeting wealthy Americans arriving in Cherbourg in ocean liners and transporting them to London, flying film producers, cameramen and equipment to shoot desert scenes, ferrying trainers and jockeys to horse races, newlyweds to their honeymoons, engineers to conduct surveys in the Persian Gulf or simply enabling business people to make urgent meetings. It had been so successful in driving the growth in demand for air travel that in 1937 it chartered one of its own aircraft, *Heracles*, to take guests on a special luncheon flight from Croydon to celebrate this HP45's millionth mile of flying since entering service, during which time it had transported around 80,000 passengers.

Special charters that year had seen destinations such as Dublin, Liverpool, Birmingham, Le Touquet, Saint-Malo, Marseille, Marienbad and even Calcutta. The company noted, "Modern travellers have become so sophisticated that even a first experience of air travel is now taken very much as a matter of course. People accept the fact that air-lines operate with just the same dependability and comfort as do surface transport routes, although it is a fact that many passengers making a flight for the first time say that they are looking forward keenly to the thrill of leaving the ground and feeling themselves in actual flight."

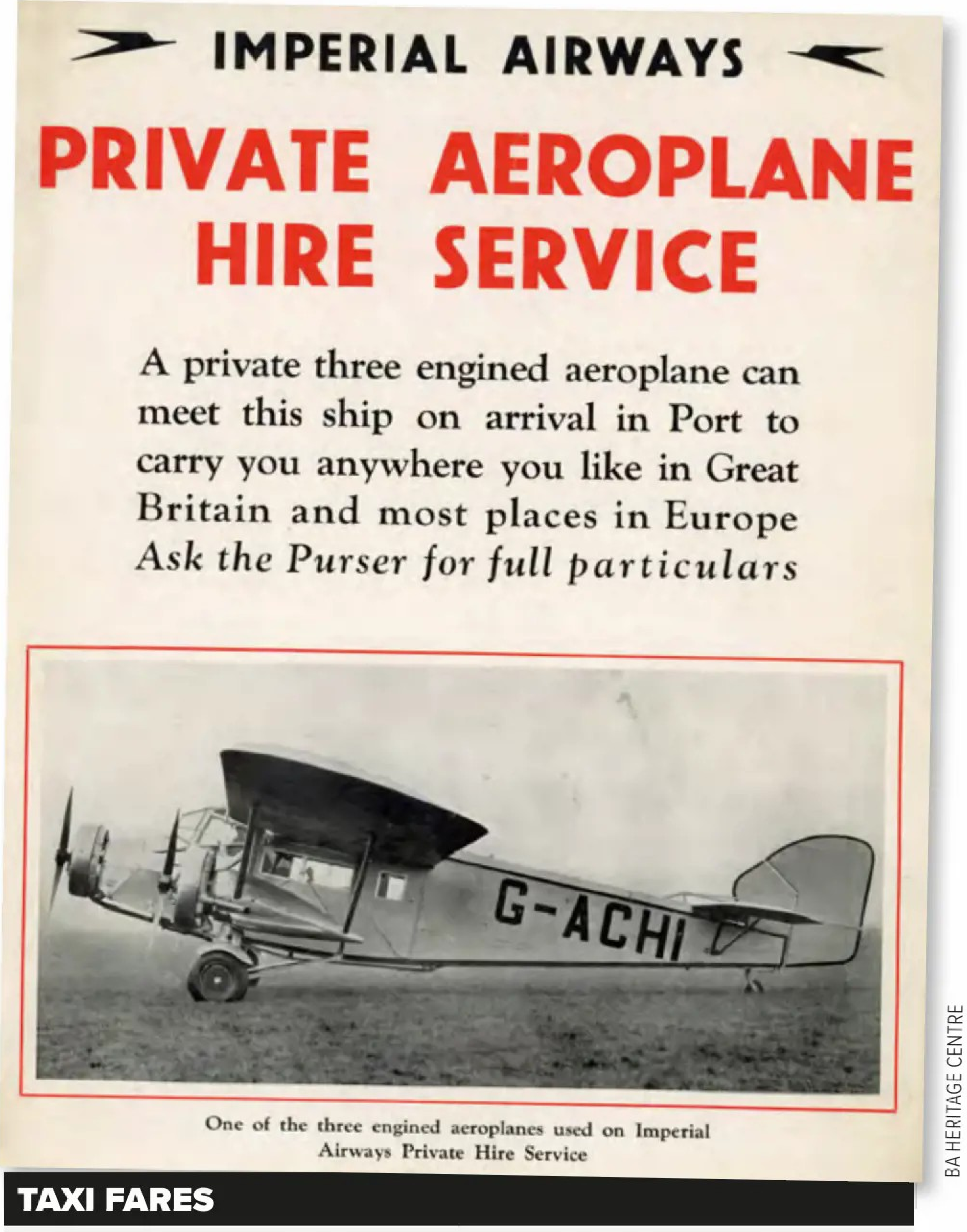
Forty-passenger Armstrong Whitworth AW27 Ensigns were pressed into use on Tea Flights during 1938, partly as shakedowns to put the newly delivered machine through its paces — it was also employed on the Paris run — in preparation for joining the carrier's routes to India and the Orient. The Ensign was popular with Tea Flights passengers, one newspaper correspondent commenting, "we took off in 20 seconds and climbed comfortably over the roofs and then the trees with their long shadows to the west of Croydon. Then for half an hour, while tea was served, we cruised over London — first to Richmond and the Thames. Our flying parlour seemed as comfortable and almost as quiet as if it were a ship's saloon."

As late as 1938 Imperial's board was noting the increasing airmindedness of the travelling public, reporting how the short Paris route, "seems to have a special appeal for those making their first acquaintance with air travel. Evidently people enjoying their 'baptism of the air' as passengers appreciate the size and comfort of the big London-Paris air-liners."

But the tense geopolitical storm clouds over Europe by the summer of 1939 were curtailing pleasure flights and charter activity. In April the redoubtable *Heracles*, which had now carried more than 100,000 passengers in excess of one-and-a-quarter million miles, took a party of schoolboys on a sightseeing voyage over London, followed by another for apprentices of the British Thomson-Houston electrical engineering company, and on 17 June a special charter operated to Derby for the airport's official opening. Two of the last pre-war pleasure flights were made on 8 July: 'baptêmes de l'air' from Le Touquet for local schoolchildren, one for 34 girls and the other for 34 boys aboard *Heracles*.

Imperial Airways and British Airways Ltd would be merged into BOAC in 1940, and the Tea Flights and other pleasure flights and charters became a distant memory of happier times, but while peace reigned they had played a crucial role in improving British awareness of aviation.

The author thanks Jim Davies of the British Airways Heritage Centre for providing access to primary source material.


IMPERIAL AIRWAYS

PRIVATE AEROPLANE HIRE SERVICE

A private three engined aeroplane can meet this ship on arrival in Port to carry you anywhere you like in Great Britain and most places in Europe
Ask the Purser for full particulars

One of the three engined aeroplanes used on Imperial Airways Private Hire Service

BA HERITAGE CENTRE

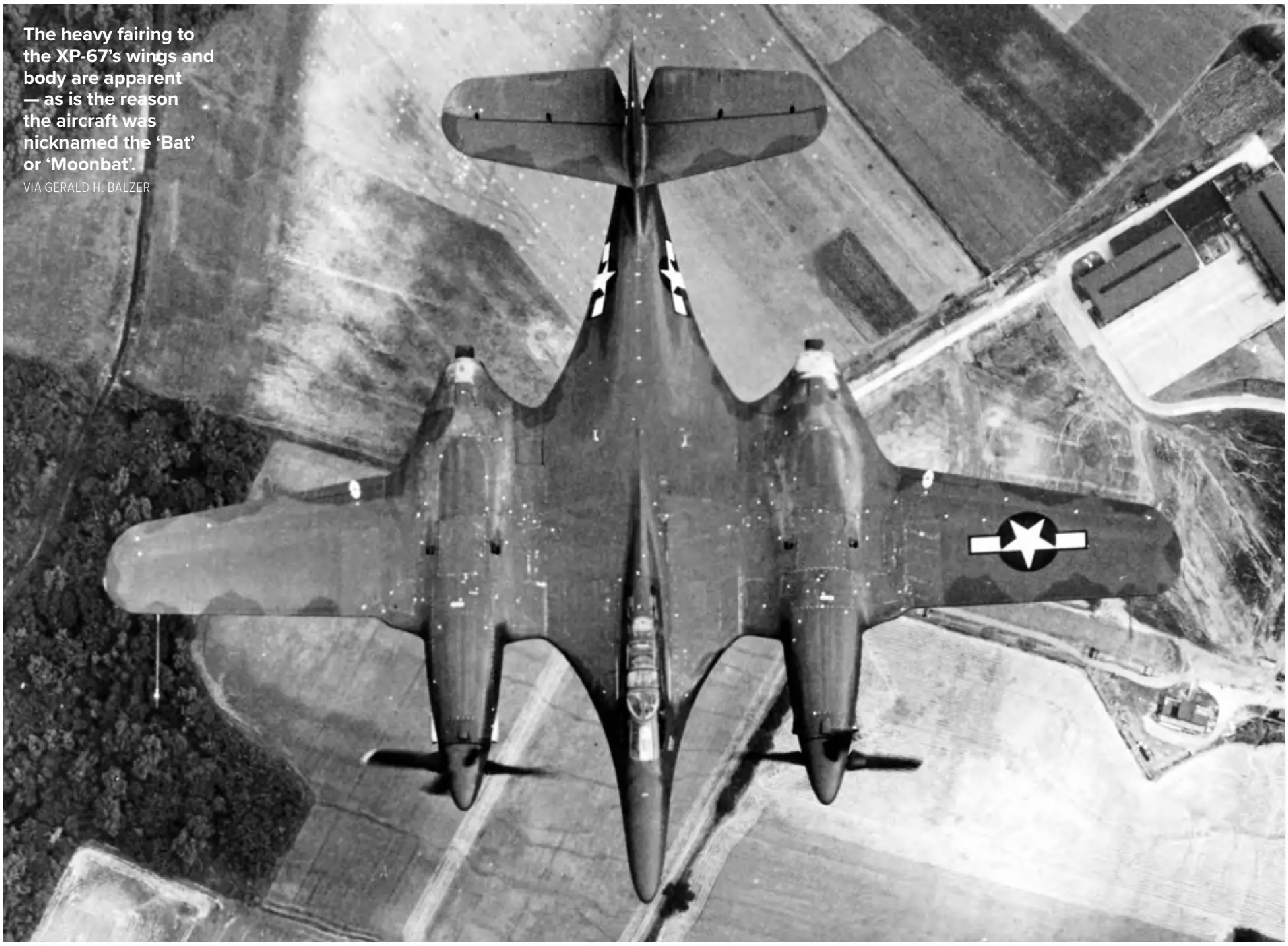
TAXI FARES

Imperial Airways' Air Taxi service was able to be booked directly or via travel agents and using any aircraft type in the fleet, which could be readied within an hour or at daybreak if making the booking overnight. Rates were charged as follows:

One-seater (or 200lb)	1s 9d per mile
Three-seater (or 600lb)	2s 0d per mile
Four-seater (or 1,000lb)	3s 0d per mile
Five-seater (or 1,200lb)	3s 6d per mile
Twelve-seater (or 2,500lb)	5s 0d per mile
Twenty-seater (or 4,000lb)	10s 0d per mile

Short flights from Croydon could be hired at the following rates:

	10 minutes	**30 minutes**
Four-seater	£2 2s	£5 5s
Thirteen-seater	£6 6s	£15 15s
Twenty-seater	£9 9s	£21 21s

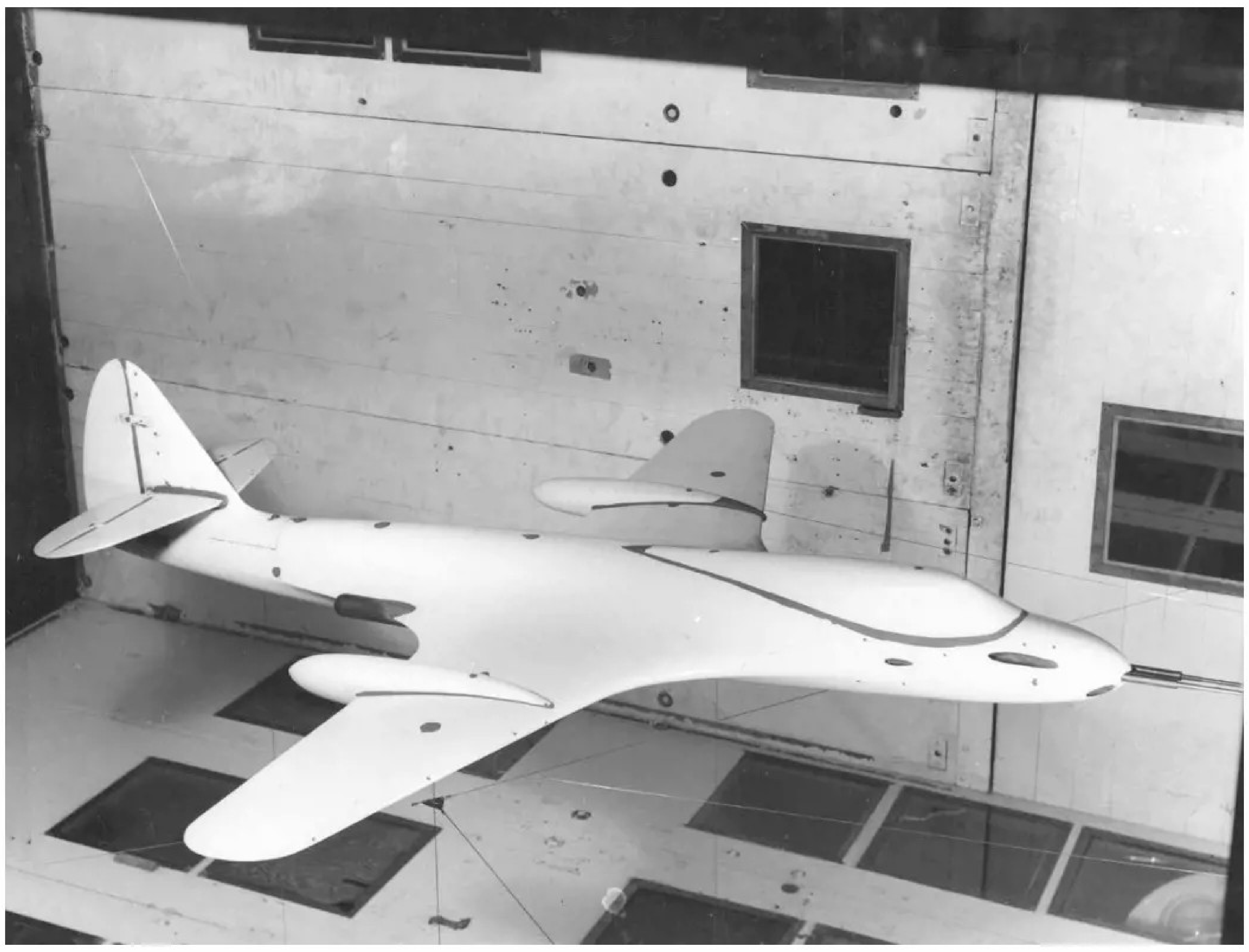


The heavy fairing to the XP-67's wings and body are apparent — as is the reason the aircraft was nicknamed the 'Bat' or 'Moonbat'.
VIA GERALD H. BALZER

BAT OUT OF HELL?

The first prototype aircraft built by the new McDonnell company, the XP-67 was at one stage looked upon with favour by the US Army Air Forces, but the manufacturer's trials programme did not proceed without incident. And then, just as it was about to begin official air force test flights, the first XP-67 was wrecked by fire. Would it have succeeded without that?

WORDS: TONY BUTTLER



LEFT:
A wind tunnel model of the original McDonnell Model 1 proposal.
VIA MARK NANKIVIL, GREATER ST LOUIS AIR & SPACE MUSEUM

Sometimes an aircraft can have a level of significance that far outweighs the quantity built. That's certainly the case with the McDonnell XP-67. In some respects outwardly outlandish, it ended up flying well, even if testing was far from a trouble-free affair. And for its manufacturer, this one-off long-range interceptor fighter proved to be something of a milestone.

As a project it started life in 1940 when the McDonnell Aircraft Corporation of St Louis, Missouri submitted its Model 1 design against a major competition for a new US Army Air Corps fighter. It had a submerged Allison V-3420 engine driving twin propellers, but the contest was won by the proposals from Vultee, Curtiss and Northrop, which produced the XP-54, XP-55 and XP-56 prototypes respectively. But despite being well down in the assessment list, the unconventional Model 1 did generate some official interest, to the point that during June 1940 the air corps decided it would purchase engineering data and a wind tunnel model.

In the meantime McDonnell continued to revise and develop its concept. A Model 2 was also turned down in July but, much later — once the firm's designers under Garrett C. Covington had changed the layout — it was followed by the Model 2-A proposal on 24 April 1941. With a further revision in early May, this proved acceptable.

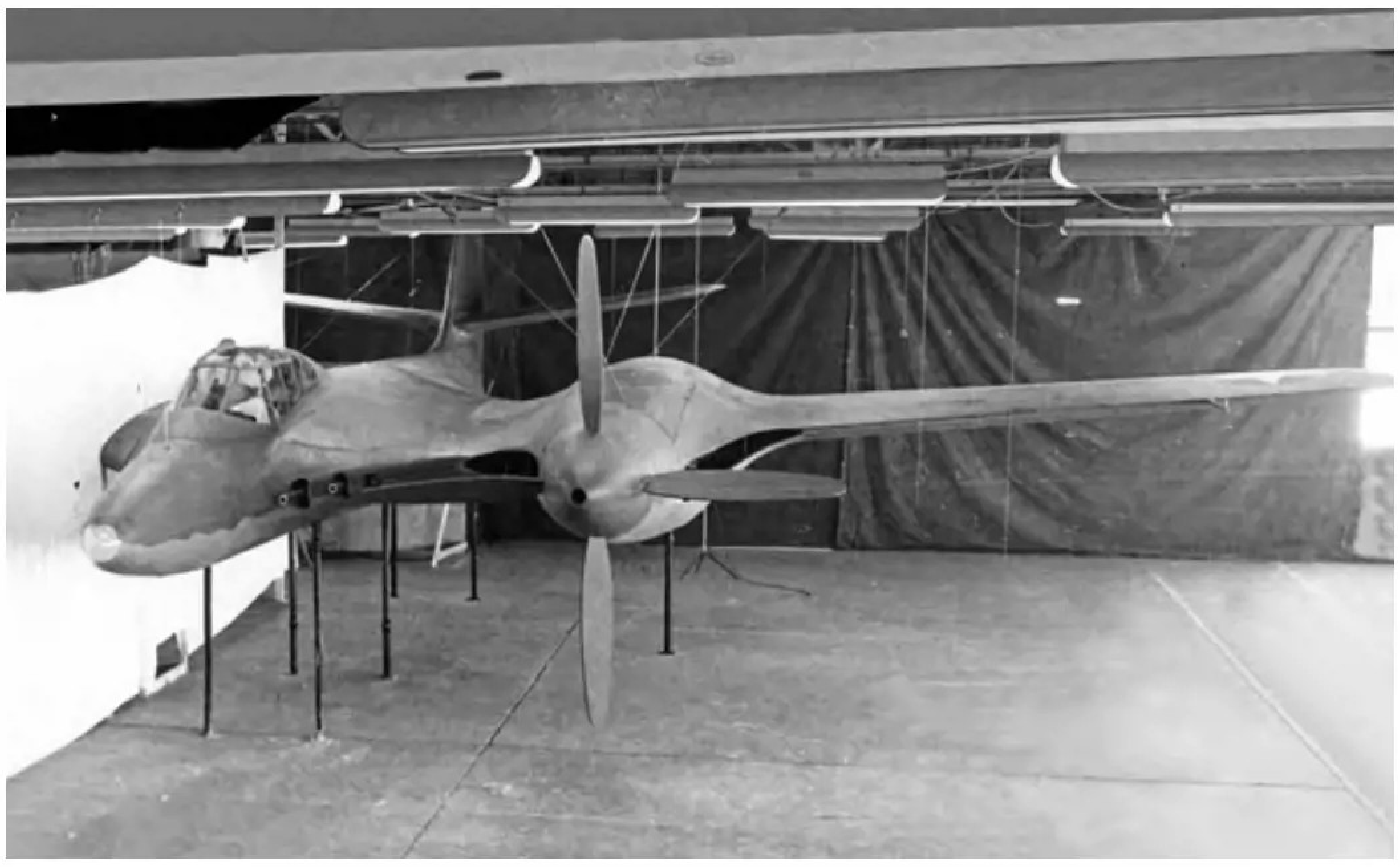
Pursuit designation XP-67 was allocated to the fighter on 29 July. A contract finalised in October 1941 described a pair of XP-67 prototypes each based around two Continental I-1430 engines, a full-size mock-up, a spinning model, wind tunnel testing — which in fact would take more than two years to clear and at times held up progress — and engine nacelle testing. The allocated serial numbers were 42-11677 and 42-11678, while the names 'Bat' and 'Moonbat', which often appear in publications covering the XP-67, were both unofficial.

There were to be periods when the future of the programme, and whether it should be continued, was cast into doubt. However, support came from several official departments, such as the Materiel Division in Washington, while the Pursuit Board approved McDonnell's project in part because it believed there was a definite need for the aircraft when no other type with comparable performance was in development.

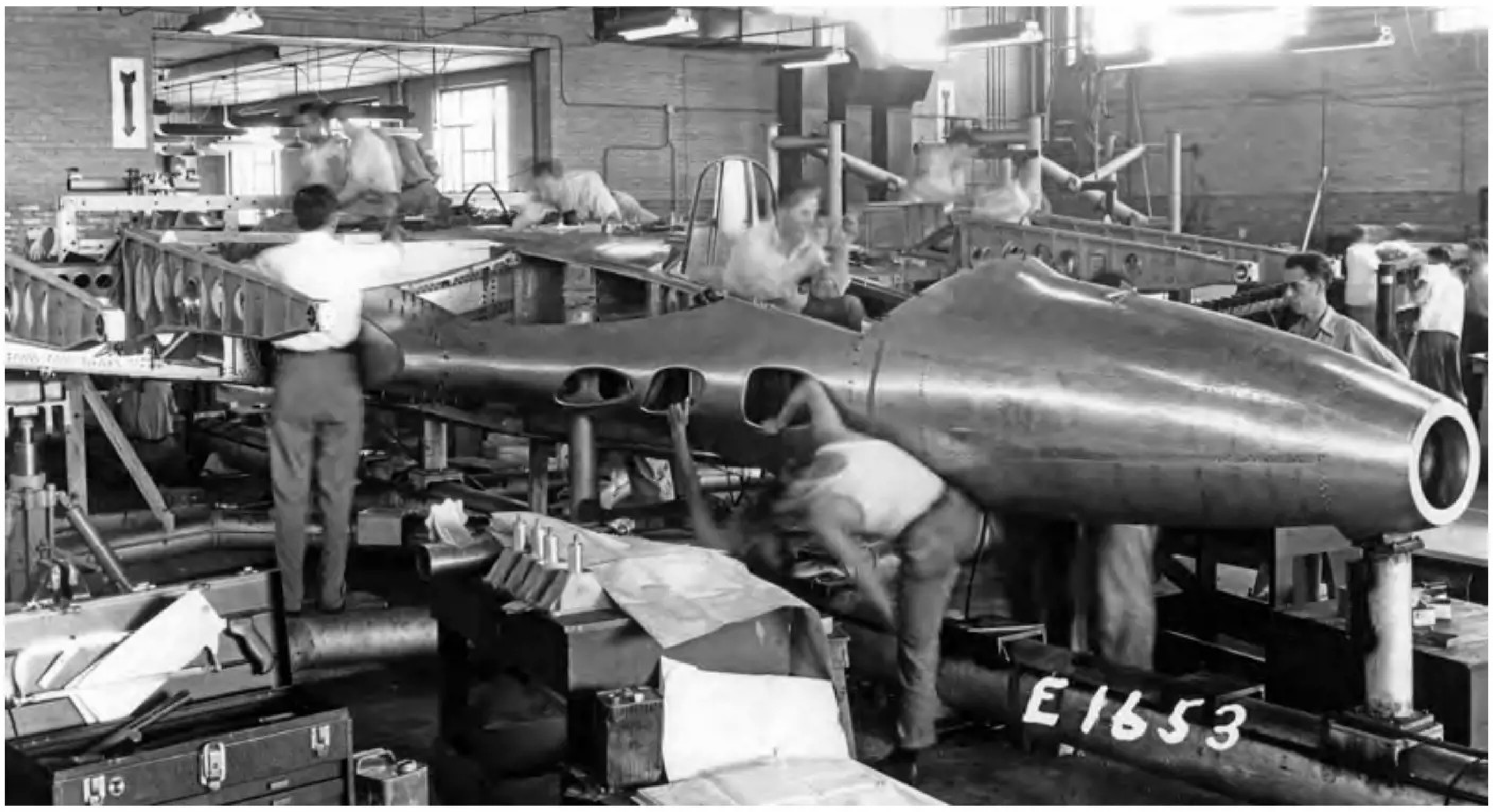
A mock-up inspection in April 1942 resulted in substantial detail changes, while throughout May McDonnell performed engine ground runs on the full-scale test nacelle. The streamlining around the XP-67's centre wings, in particular between the fuselage and nacelles, was some of the most extreme yet seen. Then on 23 October 1943 McDonnell was told to halt assembly work on the second prototype because wind tunnel testing had revealed potential problems. Now it was planned that any necessary modifications needed for the second machine should be based on the in-flight results obtained with the first aircraft.

Taxi tests with the first XP-67, 42-11677, began on 3 December 1943 and lasted five days, until on the 8th fires started in both nacelles during engine run-up. The cause was a problem which caused the self-sealing oil tanks to light. McDonnell replaced them with metal tanks. On completion, the aeroplane was taken by road to Scott Field at Belleville, Illinois to be reassembled and prepared for its maiden flight.

It took place on 6 January 1944 with McDonnell test pilot Everett Edward Elliot at the controls, but the sortie was terminated abruptly after the engine's turbo-superchargers began to overheat and start some minor fires. Thus the flight consisted of just a quick six-minute circuit of the field, though the airframe suffered no major damage. The principal outcome was the installation of stainless-steel bulkheads to seal off the turbo compartments from the main nacelles.



LEFT:
This rarely seen image shows McDonnell's full-size part-mock-up of its XP-67 design as first accepted by the Army Air Forces. Many detail changes had to be made following the official review of this structure.
VIA GERALD H. BALZER



ABOVE: The first XP-67 in the course of assembly. VIA GERALD H. BALZER

Flights two and three followed on 26 January and 28 January 1944 and proceeded satisfactorily, but flight four on 1 February was again halted after only a few minutes. With the XP-67 still over the runway, the port engine's main centre bearing burned out after the engines were unintentionally over-speeded. Then, around 200 yards beyond the runway's end, the aircraft lost its cockpit canopy and Elliot landed straight away. With replacement engines not yet available, 42-11677 was trucked back to Lambert Field at St Louis where the ducts were modified and the horizontal tail moved up the fin by 12in (30.5cm).

When the XP-67 flew next from Lambert Field on 23 March 1944, it was found the elevated tail gave improved stability and the engine cooling had been improved. Contractor's testing lasted until 5 May, all sorties being flown by Elliot, before the first flights by AAF pilots began six days later. During this period the main problems were engine roughness, aileron balancing and difficulties closing the main undercarriage door.

Materiel Command released the second airframe on 10 April 1944, allowing its construction to resume. By now this XP-67 was intended to have dual-rotation propellers, which were expected to add 7-10mph (11-16km/h) to the maximum speed.

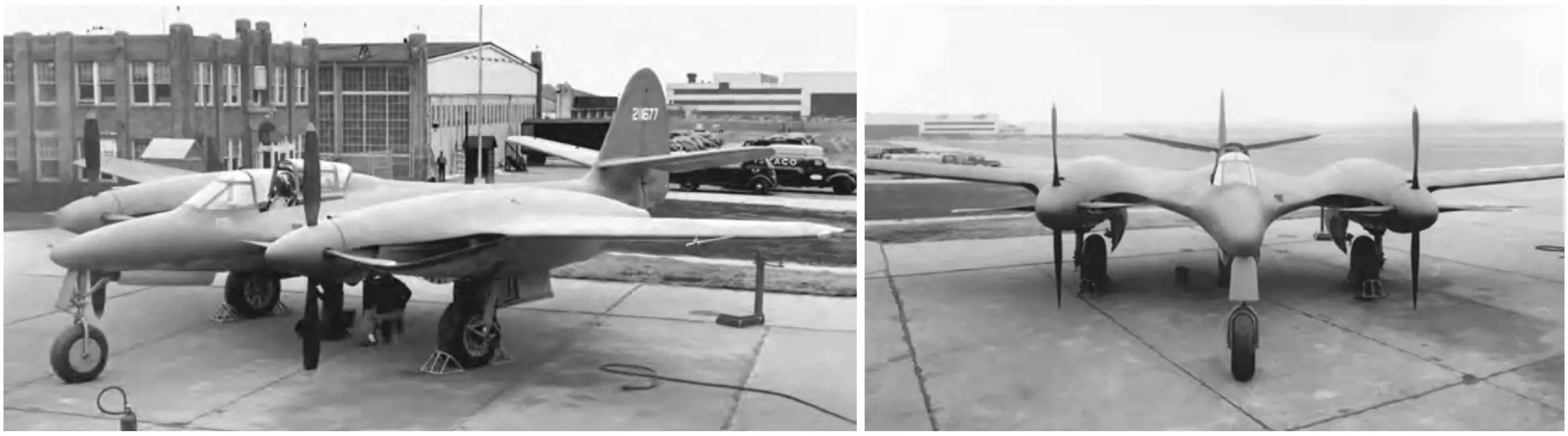
A preliminary flight test report put together by the AAF's pilots on 19 May 1944 was an extensive affair. Three of them, Col M. F. Cooper, Lt Col C. J. Ritland and Maj F. A. Borsodi, had completed five flights from Lambert Field between 11 and 13 May 1944 totalling around four-and-a-half hours. For this assessment the aircraft's six 37mm cannon ports had been covered and carefully smoothed over while the airframe itself was camouflaged with surfaces polished to achieve a high-quality finish. All flights were made at a gross take-off weight of 21,700lb (9,843kg), which included ballast for the guns and their ammunition.

There was criticism of the cockpit and instrument layout, which needed rearranging, but the XP-67 was considered fairly comfortable. That said, the control column was too high and the rudder pedals not close enough together, an arrangement that would make extended periods of flight fatiguing for the pilot.

In general the ground handling characteristics were satisfactory, though taxiing out at slow speeds was not simple because the fighter produced quick responses to bursts of engine power and to the otherwise good brakes. These problems made the start of the take-off roll difficult, but once the speed had reached the point where the rudder became effective, control was good. Against that,

> *“A major failing was the pilot's ‘very poor’ view out of the cockpit”*

RIGHT: McDonnell test pilot Everett Edward Elliot takes his turn to pose in front of the XP-67. VIA GERALD H. BALZER



As of 29 November 1943, the XP-67's tailplane is in its original position, while the head-on aspect shows how the 'humped' fairings around the nacelles and curved air intakes are most pronounced. VIA MARK NANKIVIL, GREATER ST LOUIS AIR & SPACE MUSEUM

the take-off run was described as "unusually long and gives the pilot the sensation that the aircraft is under powered". Full military power was therefore employed by the pilots for take-offs rather than the normal take-off rating. The initial climb was poor and the forward vision straight after becoming airborne was restricted considerably.

The report continued, "the rate of climb is low at all altitudes for fighter-type aircraft; indicating at sea level only 2,100ft/min (640m/min) at military power. All controls are effective from high speeds to the stall except the elevators may be blanked out at high angles of attack near the stalling speeds. The rudder becomes somewhat ineffective at slow speed with the gear and flaps extended but aileron control is good throughout the stall. At less than 200mph (322km/h) all control forces are light; however, at higher speeds (350mph/563km/h IAS) the aileron loads become increasingly heavy. Elevator forces are too light at all speeds [while] the rudder forces are heavy for single engine operation but are otherwise satisfactory. Rate of roll seems good at high speeds.

◆

"In dives at high speed with the aircraft trimmed for cruising level flight the aircraft tends to nose over into the dive and requires tail heavy trim to maintain a steady dive; then, as the airspeed is reduced, the aircraft requires nose down trim. In spite of the stick force changes the aircraft appeared to be longitudinally stable when the nose was displaced from a trimmed level flight attitude. Laterally the aircraft is neutrally stable bordering on divergence. The aircraft's directional stability is poor. The damping is slow and the aircraft has a peculiar 'swim' or 'Dutch roll' during the oscillations [which] occur at a rate of approximately 24 per minute [with] little tendency to dampen out. This condition was easily induced when flying in rough air. When trimmed for level flight, the ship tends to gradually fall off on either wing. It is felt that the aircraft would not be a good gun platform with its present handling characteristics.

"In the clean configuration the aircraft stalls at 118mph (190km/h) indicated, and the stall warning is excessive, as a slight buffeting starts at around 140mph (225km/h) indicated and increases down to the stall. The stall itself is not violent [and] the ailerons are effective at the stall and no tendency to spin was noted [but the] rudder becomes ineffective near stalling speeds."

A major failing was the pilot's "very poor" view out of the cockpit for manoeuvring. His forward view was good despite considerable distortion around the edge of the front wind shield panel, but he was seated so low against the wing that his side vision was hampered by the engine nacelles, the rear view was poor because of the wing, and downward vision restricted by the fuselage fairings. Indeed, it was not possible to see the wingtips from the cockpit, so formation flying would be "difficult if not hazardous".

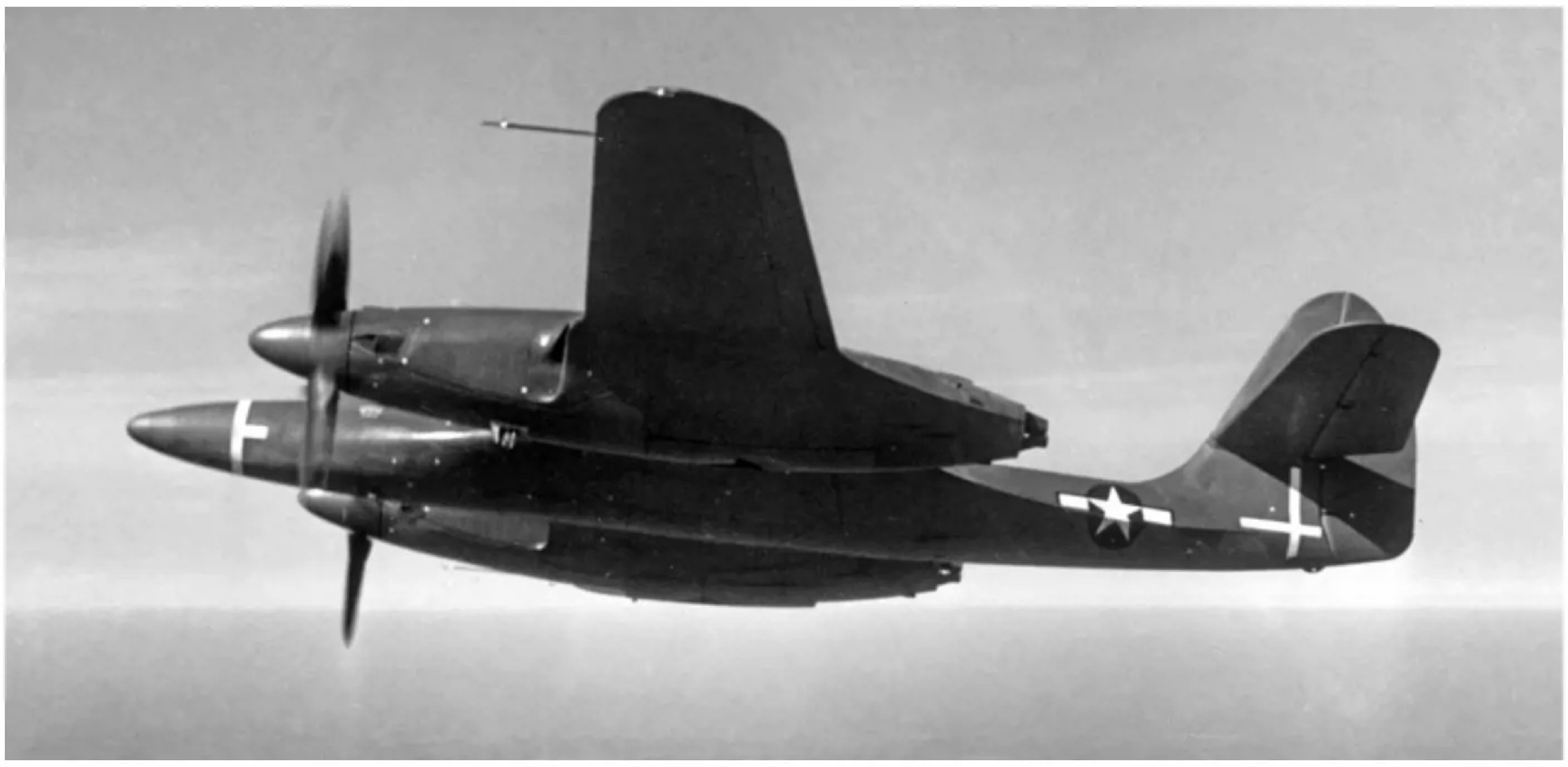
Very little change in trim was experienced when operating the undercarriage and flaps. The XP-67 would become slightly nose-heavy as the flaps and gear were extended, but a retrim was not necessary

THE 'FLYING FILLET'

The XP-67's unusual general arrangement and planform were the result of having a laminar-flow aerofoil section throughout, not just for the wing itself but also for the engine nacelles and fuselage. The basic design was an attempt to maintain true aerofoil sections throughout the entire airframe. Indeed, the XP-67 was known by AAF pilots at least as the 'Flying Fillet', due to any longitudinal cross-section through the airframe being an aerofoil section.

All-metal stressed-skin construction was employed on the full cantilever wing, principally in aluminium light alloy. Each wing was assembled in two sections, both with two spars, the inner section (attached to the fuselage side) housing the gun compartment, an engine nacelle and a split flap, while the outer section contained the aileron. All flying surfaces had a metal torque box at their leading edges and an aft section built up using metal ribs and skinning. The control surfaces too were built entirely of aluminium alloy.

The XP-67's semi-monocoque aluminium alloy fuselage had Alclad covering and housed the nosewheel, a pressurised cockpit and a portion of the split flap. The tail surfaces were mounted on the aft fuselage in a conventional manner and the normal fuel load was 280 US gallons (1,060 litres) with a maximum capacity of 735 US gallons (2,782 litres), all distributed across four main tanks located in the wings and in the fuselage. A fully retractable, nosewheel tricycle undercarriage was fitted with a wheelbase of 15ft 8in (4.78m). The main gear retracted rearwards into the engine nacelles and the nose gear rearwards into the forward fuselage. As flown the two Continental piston engines each drove a Curtiss Electric single-rotation, four-blade propeller of 10ft 8in (3.25m) diameter.



ABOVE AND BELOW RIGHT: A test flight after special calibration markings had been applied to the sides of the nose and to the end fuselage. It appears the tailplane now has the increased dihedral, and it has certainly been moved to its slightly higher position.
VIA GERALD H. BALZER

due to the very light elevator forces. Even with power on the approach was steep, but the aircraft landed easily despite having a high landing speed at contact of about 120mph (193km/h).

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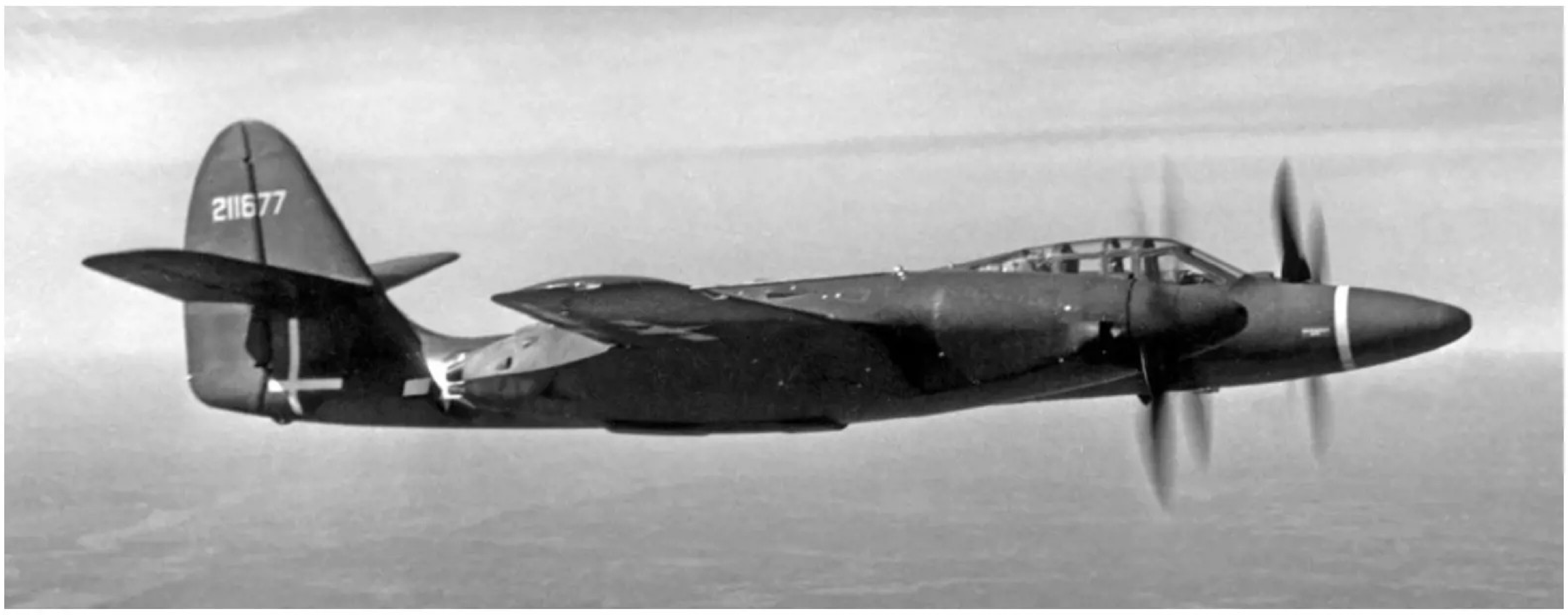
The AAF pilots did not collect any flight test performance data, but speed checks were made at military power against a calibrated single-engine North American P-51B Mustang at both 10,000ft and 22,000ft (3,048m and 6,706m). The maximum level speed at 22,000ft came to 272mph (438km/h) indicated, which corrected to approximately 393mph (632km/h) true, while the 10,000ft run at the same power corrected to approximately 357mph (574km/h).

Their report concluded that the performance of the XP-67 "was not good in comparison to present fighters, particularly in rate of climb, take-off and landing characteristics and service and combat ceiling". In respect to stability and manoeuvrability the flying characteristics left a good deal to be desired and pilot visibility was poor for all conditions of flight. In fact, with its long take-off run and high landing speed the aircraft was not considered safe for the average military pilot.

McDonnell was authorised by Materiel Command on 30 May 1944 to install dual-rotation — contra-rotating — propellers on the first prototype to enable performance data to be collected. Various solutions were assessed in an effort to increase lateral stability, including wires on the rudder trailing edge, a dorsal fin and lastly an increase in dihedral from 5° to 7°.

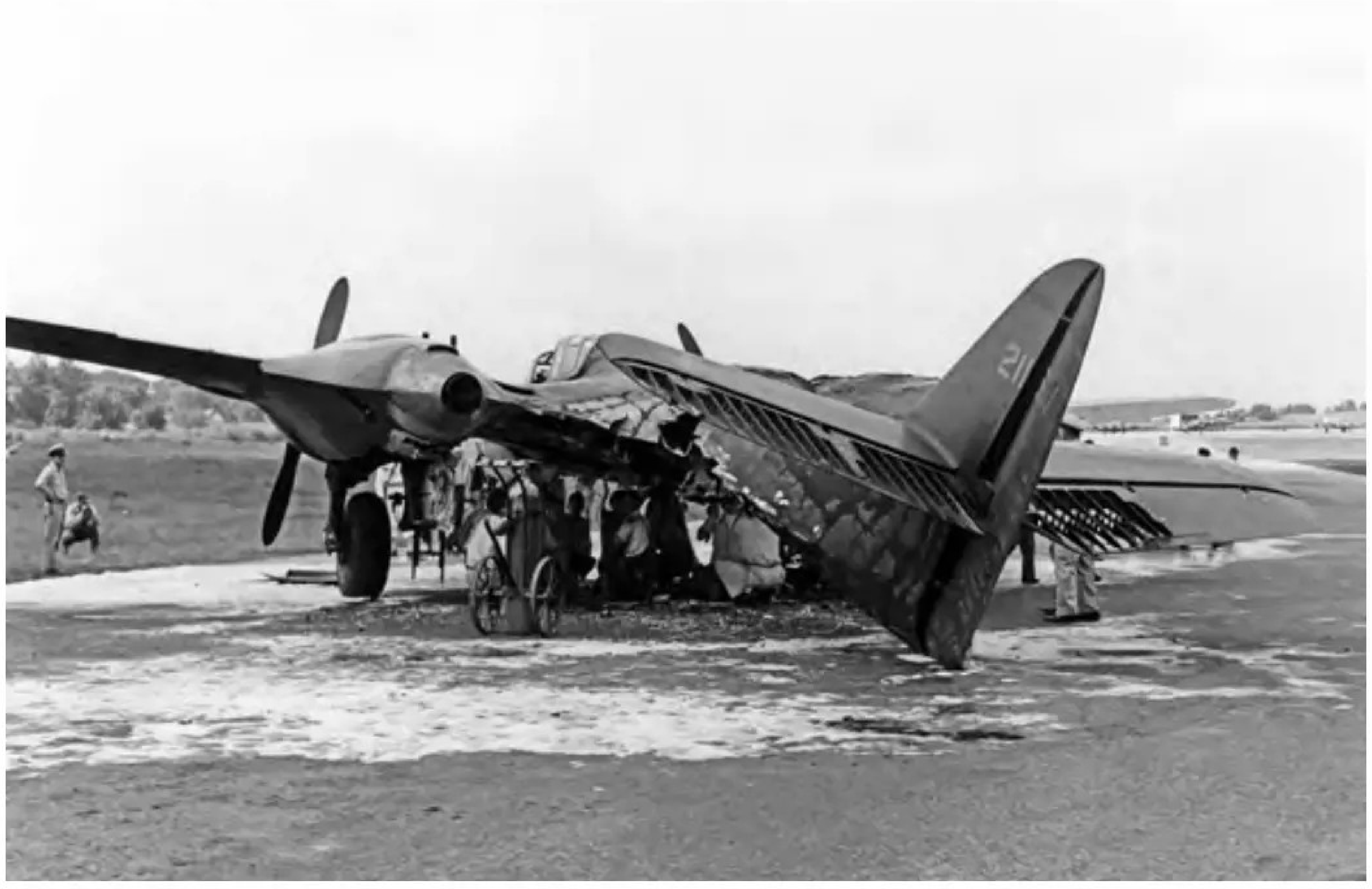
One proposed alteration again involved the propellers. Tests undertaken by Continental had determined that, with 150-grade fuel, a war emergency rating of 2,100hp could be realised without using water injection, while studies by both McDonnell and Materiel Command had suggested a single-rotation Aeroproducts propeller blade, 11ft (3.35m) in diameter, would be suitable for this rating. Accordingly, the dual-rotation propeller plans were replaced by this new fitting, approved on 20 July, but it was never destined for fruition.

During this period the XP-67 was test-flown by several more Army Air Forces pilots, while McDonnell's 'contractor' flight trials included a programme of drag reduction, embracing smoother fairings and



HYBRID POWER

McDonnell produced some alternative P-67 variants. The most attractive option seemed to be a switch to Rolls-Royce Merlin RM 14SM piston engines in the forward nacelle with jet units replacing the turbos in the rear. The XP-67E of 1944 had twin 1,925hp Packard V-1650-11 Merlin engines driving four-blade propellers, plus a pair of 2,300lb-thrust General Electric I-20 jets in the rear of the nacelles. The airframe dimensions were unchanged and this proposal was studied closely by the AAF, but it did not progress beyond the drawing board.



LEFT:
The sorry state of the XP-67 following its landing fire on 6 September 1944. It soon went for scrap.
VIA GERALD H. BALZER

the elimination of extraneous items. On 18 July 1944 the Requirements Division in Washington referred again to the aeroplane's poor take-off performance, but otherwise, "the general flight handling characteristics of the aircraft are delightful. It handles exceptionally well, has beautiful stall characteristics, and the roll characteristics are good, although the control forces are high."

Clearly, some enhancements had now been made to the aeroplane and by 24 August McDonnell had completed an extensive process of rework and repairs to 42-11677. Ground tests were conducted that day, and on 28 August a five-minute flight was recorded, ending suddenly thanks to a drop in engine oil pressure. Further brief flights took place on 31 August and 2 September.

Almost everything was ready for the XP-67 to start official AAF trials when, on 6 September 1944, the aircraft was damaged beyond repair. Having taken off from Lambert Field, Elliot was conducting checks at 10,000ft (3,048m) when he lost power in the starboard engine. The first indication of fire appeared when the aircraft had descended to 3,000ft (914m), but by the time he landed smoke and flames were coming out of the nacelle. Elliot attempted to stop 42-11677 at such an angle to the wind that the flames would be pushed back, but the starboard brake did not hold and the aircraft turned crosswind, coming to rest on the ground in a position that meant the fire was able to spread, with wind assistance, across the fuselage and to the port wing. The fuselage, right engine nacelle and wheel well were all burnt out and the left wing and its nacelle considerably damaged. Elliot escaped uninjured.

The fire was the result of the rocker arm on the number one cylinder failing, which by staying closed allowed hot exhaust gases to enter the intake manifold; this caused a backfire which started the conflagration. In view of the very long time required to effect repairs, or to finish the second prototype — at this time just 15 per cent complete — it was decided to terminate the XP-67 contract. Another factor was the potentially superior performance of the upcoming first generation of jet-propelled fighters, which made any P-67 production plans unlikely to proceed. In all 42-11677 had accumulated 43 hours of flight time, all sorties having been conducted from Lambert Field bar the first four out of Scott Field. Neither the armament installation nor the pressure cabin was ever fitted or tested.

Contract termination was mutually agreed between McDonnell and the AAF on 13 September 1944. Formal cancellation was made effective on 24 October, although two weeks before this the manufacturer was cleared to begin dismantling the aircraft; the second prototype was never completed. But despite failing to win a production order for P-67s, McDonnell had done enough to become established as a manufacturer of fighter-type aircraft.

XP-67 DATA

POWERPLANTS	
Two Continental XI-1430-17/19 liquid-cooled piston engines, 1,600hp each (war emergency rating 2,100hp)	
DIMENSIONS	
Span:	55ft 0in (16.76m)
Length:	44ft 9.25in (13.66m)
Wing area:	414 sq ft (38.50 sq m)
WEIGHTS	
Design gross weight:	22,114lb (10,031kg) with 280 US gallons (1,060 litres) of fuel
Maximum take-off:	25,400lb (11,521kg) with 735 US gallons (2,782 litres) of fuel
PERFORMANCE	
Maximum speed:	405mph (652km/h) at 25,000ft (7,620m) at 22,000lb (9,979kg) weight
Sea-level rate of climb:	2,100ft (640m) per minute
Service ceiling:	37,400ft (11,400m)
Maximum range:	2,385 miles (3,837km) with 735 US gallons (2,782 litres) of fuel
ARMAMENT	
Six 37mm M-4 cannon, three in each inner wing (never fitted)	

Thanks to Gerald Balzer, George Cully, Mark Nankivil of the Greater St Louis Air & Space Museum, and the archives at Maxwell AFB.

AEROPLANE *met...*

WALTER EICHHORN

A TRIBUTE

In the development of Germany's historic aircraft scene, Walter Eichhorn was a pivotal figure — just as he was in the field of sport parachuting. On his death at the age of 88, we revisit a highly entertaining '*Aeroplane* meets...' interview with him from 2016

WORDS: BEN DUNNELL

RED BULL CONTENT POOL

ABOVE: At the controls of Fairchild Cornell CF-EHH at Toronto Island Airport on 20 November 1960, with then girlfriend — and future wife — Liesel in the back.
LARRY MILBERRY

There have now been more than 120 of our '*Aeroplane* meets...' interviews, and it's no exaggeration to say each of the subjects has been a stand-out in his or her own way. But, inevitably, some come to mind as particularly memorable, and high among those is Walter Eichhorn. While he was still flying displays in historic aircraft at the end of the last decade, by then into his 80s, he took his first steps in aviation at a time when it was only just being permitted again in his homeland, for the victorious Allies had stopped Germans from flying at the end of the war, and if they wanted to do so they had to go overseas. That's exactly what Walter did. Then it took quite a while for any sort of aviation heritage scene to develop in Germany, but when it did, he soon got involved.

For me it was a genuine pleasure to go and see Walter at his home in Bad Camberg, a lovely town in the state of Hessen. There pictures were hung on many of the walls proudly showing his aviation exploits, not least from the years when he became a 'go-to' man for flying Messerschmitt Bf 109s and Hispano Buchóns, then rarer than they are now. We talked for hours, punctuated by a trip down the road for coffee and cake. And it was a hugely enjoyable day, his stories made all the more entertaining by his humorous delivery, which — listening back — still reminds me of an old-school New York comedian. After Walter died on 25 May, at the age of 88, I read it afresh and felt we should pay tribute, as with Desmond Penrose last month, by revisiting our interview.

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The north German town of Jever was where Walter was born in 1936. His father was stationed there with the Luftwaffe as a maintenance crewman, and they lived just off-base when the war broke out.

"I saw aircraft every day, more going than coming back. That I did not like, but I liked the flying. I knew when I grew up I wanted to be a pilot.

"I had to leave school when I was 14, and started an apprenticeship as a mechanic. I had a friend who was two years older than I was, and he also wanted to go flying. We figured at that time that there would never be any flying in Germany by Germans ever again. My friend left in 1953 to go to Canada. He signed up with a farmer for two years, and the farmer paid for his trip. That I didn't want. I said to him — all in writing, each letter taking four weeks — that it would take me another year, but then I would follow him."

After the war, Jever became a major RAF station.

"The Brits were building a concrete runway. It was a big construction site, and I, without having a driving licence, drove dump trucks around it. There was a lot of pressure time-wise, and they decided to have the site open 24 hours a day, seven days a week. They asked the drivers whether they wanted three men on the trucks doing eight hours each, or two guys each doing 12 hours. They decided on the 12 hours as they all wanted to make money, which suited me fine. I needed the money, so I did this for almost a year. Then I had enough to pay for the trip to Canada. Off I went in 1955.

"It took me a year to get a good job, again as a mechanic. I was working for Loblaws, a food company that had its own trucks. From where I was working, Toronto Island Airport was a 10-minute walk and a five-minute ferry trip away. There was a company there called Central Airways, run by two Chinese flight instructors. They had their own workshop, and the chief mechanic was Helmut, a German. For about two years, I went down after work and helped out. I was not an airplane mechanic, but I could change spark plugs, change the oil and so on. I didn't get money for it, but when they had time they said, 'OK Walter, you can go for a flight'.

"I was 22 when I started to learn to fly. The first aeroplane I flew was a Fleet Canuck. It took about six months for me to get my pilot's licence. Before that, when I'd got just two or three hours solo, I bought a Fairchild Cornell that was sitting at the airport. It was real cheap. I'll never forget the first time I flew it. I climbed out and it was doing 60kt. That seemed about right. Then I was flying in level flight and it said 60kt. Kind of slow, I thought. I started diving, and it was doing 60kt. At that point I thought that maybe the air speed indicator didn't work…

> ***"I thought, Jesus, that is* it. *I have to have a Harvard"***

"I think I put about 70 hours on the Cornell. One day I took it to Kitchener, Ontario, where I parked beside this Harvard. The owner, Gerry Younger, gave me a ride. I thought, 'Jesus, that is *it*. I have to have one of these'. I looked around, and in Brampton, Ontario there was an ex-RAF guy who'd gone to Canada and bought a

RIGHT: The freshly minted Lufthansa Boeing 727 captain in June 1972. VIA WALTER EICHHORN

Harvard from Royal Canadian Air Force surplus. I knew it was for sale, and he said, 'I'll make you a deal — $2,000 for it.' I didn't have the money, but by that time I had a car I'd fixed up. He said, 'Well, I think I could use another car for my wife. Let me give you $1,000 for it and you give me $1,000 cash.' Done. I sold the Cornell for $500 and scratched together the rest of the money. So now I had a Harvard.

"Since I was flying the Harvard with a parachute, I took up parachuting. The Parachute Club of Toronto was at Goodwood, close to Lake Simcoe. I asked whether I could do a jump, but they told me I had to make at least half-a-dozen static line jumps before I could freefall. 'OK, let's go do it.'

"The first jump was kinda scary! I was supposed to go out and freefall for three seconds, and from this altitude everyone else was freefalling for 10 seconds. I had this Hungarian girl instructor — Elena was her name. I thought, 'If she can do 10 seconds I can at least do eight.' I jumped out, and for about six to eight seconds it was OK. I reached in to pull the ripcord, but I wasn't symmetrical. The next thing I knew, I was on my back and the parachute came out between my legs. But after a few more jumps, I got to like it more and more."

RIGHT: Walters Vögel performing a 10-man 'snowflake' jump. VIA WALTER EICHHORN

He flew as a parachute jump aircraft pilot too, and when the Canadian team needed a pilot for the 1964 World Parachuting Championships at Leutkirch, West Germany, Walter travelled there to fly U-1 Otters provided by the US Army, even though he was a civilian. The following year his father wrote to him with news that Lufthansa was now hiring West German pilots who had existing flying experience. He was accepted for training.

"I went to Hamburg, and there were 16 of us. All the others were ex-military pilots. Of the 16, four made it. I went back to Canada, and on a Thursday about six weeks later I got a telegram telling me to be at the Lufthansa flight training centre at Bremen the next Monday. I went to my boss, and he was good — he said tomorrow I'd have all the papers I needed. At the weekend I had a little party and sold everything I had, all my tools and so on. The only thing that was still sitting out in the field was my Harvard. I meant to bring it over to Germany but it never worked out. I sold it, but I lost a little bit on it — I got $1,500 back."

Walter joined Lufthansa in 1966 as a co-pilot on the Convair 440.

"The instructors were from the generation that flew during the war. Some of them were real tough guys. On my first flight in a Convair, I'm sitting in the left-hand seat as co-pilot; in the right-hand seat was a captain, acting as a check pilot. The fleet boss was standing between us. The young guys, who came up out of school aged 19 or 20, he would probably have reduced to tears. I thought I was doing really well. He started yelling not at me, but at the captain: 'Can't you see what he's doing?' The captain was saying, 'He's only 2kt off the speed.' It made me laugh when the boss said, 'Eichhorn, you're not a bush pilot in Canada any more, you're supposed to be an airline pilot now!'

"The Convair had a zero-reader, a form of flight director, as an extra instrument [at the top right of the panel]. I'd never flown with that before. The fleet boss was still standing there, in the middle. He reached over, took the controls, and flew an ILS [instrument landing system] approach just like that. The shouting and yelling did not impress me. What impressed me was action. I thought, if he can do that standing, I've got to be able to do it sitting down."

> ***"The boss said, 'Eichhorn, you're not a bush pilot any more!'"***

ABOVE:
A meeting with 'ace of aces' Erich Hartmann (centre) to talk Bf 109 technique.
VIA WALTER EICHHORN

From the Convair he transferred as a co-pilot to the Boeing 727 and then the 747-100, achieving his captaincy on the 727 in 1972. But he always found room for parachuting. By the early 1970s, he and a four-man team were becoming established on the West German parachuting scene.

"I knew that the big thing at the next world championships was going to be the 10-man 'speedstar', and I decided to train before everybody else got in on it... About 17 guys were interested, and we met in a room at a restaurant. I explained what I wanted, and one of them asked, 'What's your intention? What are you planning on doing?' I said I wanted to go a world championship as a jumper, and what do you need to do before you go there? You need to be German national champion, otherwise you're not going to the world championships, right? So that was the plan: to train with a 10-man speedstar team for the world championships. He started laughing. I said, 'OK, you can sit here and listen to this, but you are not going to be on this team.' I had no use for guys who didn't take it seriously enough. He and another guy just got up and left, but the other 15 came to a training camp."

The resulting team was called Walters Vögel (Walter's Birds). In 1973 formation skydiving became a world championship discipline, and at three successive contests they finished third overall, as well as taking three victories in a row at national level. When they stopped jumping competitively they carried on doing so at events like

LEFT:
Hans Dittes' Buchón D-FEHD in its *Piece of Cake* scheme.
DENIS J. CALVERT

RIGHT: **Nick Grey (right) let Walter taxi The Fighter Collection's Spitfire IX ML417 at Manching in 1998.**
VIA WALTER EICHHORN

airshows, at one of which in 1976 Walter got to know Georg Röth who had a Harvard, D-FHGK.

"For about two years, I flew it for him. I was flying it more than he was, and I became part-owner. Two years later, Georg said to me, 'Do you want to buy the rest of it?' I didn't know then why he was doing this, but he wanted it to be in good hands, so I bought the airplane. I went to his 50th birthday, and four to six weeks later he was in hospital. I called his wife, and she said, 'He's back home', but she added something like, 'Don't wait too long if you want to see him again'. Do I need to tell you the rest of the story?"

After Röth's death, Walter kept the Harvard until 2020. In the 1980s, his displays in it led to contact from Hans Dittes, who wanted Walter to ferry two ex-Spanish Air Force Harvards from Cuatro Vientos to his base in Mannheim. Then came another project for Dittes.

"He saw a Buchón [serial C.4K-141] sitting in a hangar in Spain. He said, 'It's a dream of mine to fly one of these things'. I told him, 'It's a dream of mine also. Shall we go back to 1945?' About a year later, he calls me up. 'Walter, you've got to come down'. He wouldn't say what it was about. It was almost two hours' drive, but I got in the car. He used to have a big trucking company in Sandhausen, just outside Mannheim. When I arrived, there was a large flatbed in his yard, and a crane lifting the Buchón off it. He gave me some books, and said, 'If you want to, you can test-fly it'.

"I asked the Luftfahrtbundesamt [Germany's CAA] and spoke to one of the older guys there. He said, 'You have the Harvard rating — that's good, but I want you to bring a letter from a guy who has flown the 109, saying that he's taught you everything he knows'. He even gave me a few names, but I'd never heard of them.

"I mentioned this at our next Vögel meeting. One of them said, 'Why don't you ask 'Bubi' Hartmann?' I thought, 'Well, why don't I ask the Queen, or the Pope?' But he was in the same aero club as Hartmann, in Poltring, and he arranged it.

"I gave him a call. Hartmann asked me, 'What do you fly?' I thought I'd really impress him by saying I was a captain on the DC-10. He didn't say it, but it sounded like he was thinking, 'Oh, shit — a Lufthansa captain wants to fly a 109'. He said, 'What else are you flying?' I told him I also had a Harvard. 'Oh, well, come down here with the Harvard'. Poltring was quite a short field, down a slope. I landed, and he said it didn't look too bad. I went flying with him for 20 minutes to half an hour, and he thought it was alright, but told me the 109 was rather different here and there.

> ***"Erich Hartmann had a few tricks that were not in the books"***

"He asked me where I'd learned to fly the Harvard. He assumed I was ex-military. I said, 'In Canada'. He was interested in that. He was just 23 when the war was over, with 352 confirmed kills — can you imagine that? Then he was a prisoner of war for 10 years. When he came back, it was just when the Luftwaffe was being restarted. He was one of the first to go in, and his training was done in Canada. I knew guys in Lufthansa who had flown with him, and they said he was good up to F-86s. By the time of the F-104, he was getting old. I say now that I was still a young man when I started flying the 109 — I was only 50!

"I'd arrived there around one o'clock, and by now it was getting dark. He invited me to come back

SENNHEISER
Red Bull
15
D-FHGK

BELOW: **Walter's Harvard IIb, D-FHGK, was among the first Red Bull-sponsored historic aircraft. He flew it at several AirPower shows at Zeltweg.**
RED BULL CONTENT POOL

LEFT: **Getting airborne from La Ferté-Alais in the Messerschmitt Stiftung's Bf 109 G-6 D-FMBB, which he called his favourite 109.** DR ANDREAS ZEITLER

some day and talk more. Then he started to talk 109. I asked him to talk slower, because I was making notes. That was the checklist that I used from my first day flying a 109 to my last. He had a few tricks that were not in the books. For instance, I asked him how much flap he used for take-off. He said, 'On the take-off run, I just cranked down the flaps until the cooling flaps are almost level.' That was maybe 18 or 19°.

"Another thing Hartmann said: never over-boost it or give it more power than you can handle. When you put power on, the airplane wants to go off to the left. I didn't just put in a certain amount of right rudder; I gave it full right rudder and put the power in until I was moving to the right. Then you could get the power off, or let the rudder off to get it back. I just added power, so I had control."

Walter made the maiden post-restoration flight of D-FEHD on 30 August 1986, and it was much in demand. So was Walter, such as when London Weekend Television wanted him to fly for its adaptation of Piece of Cake.

"They arranged that I would go over to [the Confederate Air Force at] Harlingen, with my wife and two kids, to fly their Buchón. Just the week before, it crashed. They sent me over anyway. The CAF had a second airplane — all it was missing was the prop. But they didn't get it finished in time, so the television people decided to do it in England."

That was in the Dittes aircraft, alongside the two other Buchóns flying in Europe, belonging to Nick Grace and Charles Church.

The same three aeroplanes then had a major role in 1989's filming at Duxford of Memphis Belle, *though Nick Grace's aircraft had been sold after his death to the Old Flying Machine Company. Ray and Mark Hanna were the chief pilot and aerial co-ordinator, and Walter treasured his recollections of working with them. One scene, where the Buchóns approach a finger-four of P-51 Mustangs head-on, firing their guns, stuck in his mind.*

"The first thing I could see was the B-25 [cameraship], with its navigation lights on. Next I saw the bombers, and then four little specks, which were the Mustangs. I can hardly talk as fast as they were coming up. We came through, really moving.

"In another scene, *Memphis Belle* was on my right, and in front of me was one of its Mustang escorts. I was right on the tail of the Mustang. All of a sudden, a voice said to me, 'Walter, look over your shoulder, but don't panic.' I looked, and there were the eyes of Tony Ritzman. He was piloting the B-25 right beside me, filming this. Our 'Messerschmitt' formation was split up — Ray was coming over the top of the B-25 and going for the B-17 next to *Memphis Belle*, aiming, I think, for its left-hand engine. The Mustang in front of me followed Ray, and when he rolled over on his back, I rolled with him — I had no option, because I was right in his slipstream."

LEFT: **Test-flying Ed Russell's newly restored Bf 109 E-4.** ERIC DUMIGAN

Vorsicht beim Öffnen

RIGHT: *Valkyrie* star Tom Cruise was fascinated by the Bf 109. VIA WALTER EICHHORN

In 1995, Walter was back at Duxford to display Lufthansa's Junkers Ju 52/3m at Flying Legends.

"On the Saturday evening, Anders Saether said he had no pilot for the Mustang [*Old Crow*] in the 'Balbo' at the end of the show the next day. Jokingly, I told him, 'I'll fly it.' He said, 'No problem, as long as you've got a DA [display authorisation].' I looked round, and at the next table was Rod Dean, who was then with the CAA. I asked Rod, 'How about a DA?' 'OK,' he said — 'if you're at the airfield before eight o'clock in the morning, we'll do it.' I got there, Rod came along, I flew a little display in the Mustang, he signed me off, and I could do the formation.

> ***"Tom Cruise was most interested in the Bf 109 I was flying"***

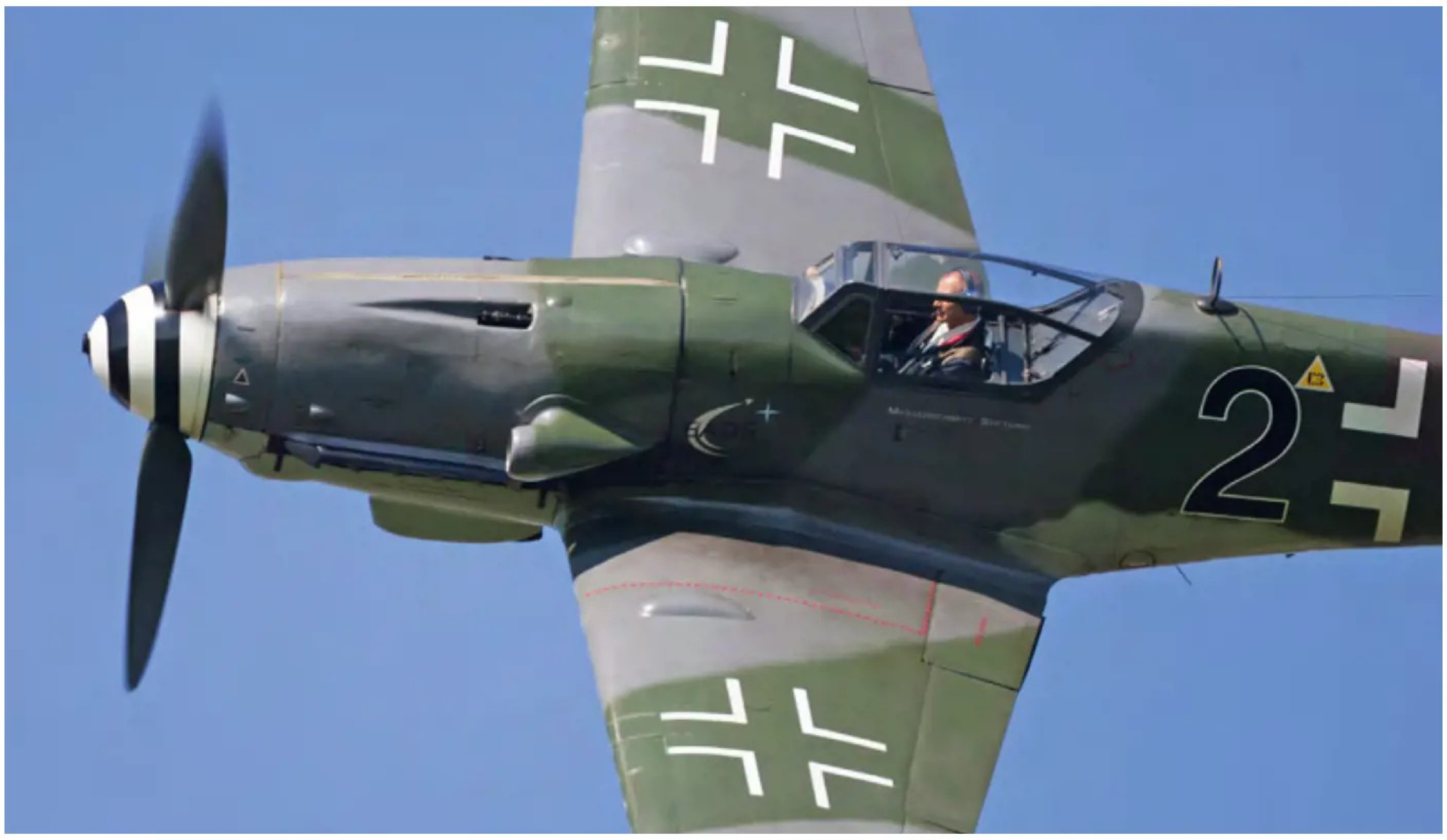
"I stepped out of the Junkers and into *Old Crow*. It was a 32-ship, and I was in the second Mustang group as number two to Nick Grey. We did it, and it went fine. But after we landed and taxied in, all the guys were laughing. I thought, what did I do wrong? Nick came over and said, 'Walter, you're the first guy we've seen get out of a Mustang in a white shirt with captain's stripes on the shoulders and a tie...'"

Flying the Buchón at Sion, Switzerland in 1989, he met some representatives of Messerschmitt-Bölkow-Blohm. It needed someone to fly its Bf 109 G-6, D-FMBB — a Buchón converted to DB605 power — when repairs were complete.

"They watched me fly there. In the evening we were eating raclette, and we got talking about 109s. One of the guys asked whether I'd like to test-fly their 109 when it was ready. They introduced me to their chief pilot so he could see what he thought of me. I got talking to him and he said, OK, all good. Then at Manching in 1993 I started test-flying it."

Walter went on to spend the next 16 years as the sole Bf 109 pilot for MBB, later DASA, Daimler-Benz Aerospace, DaimlerChrysler Aerospace and EADS. He also flew the ex-Hans Dittes Buchón in its new guise as Bf 109 G-10 'Black 2,' and Bf 109 G-4 'Red 7,' another former Buchón, but the G-6 was his favourite.

"One of them had an engine failure, another one a gear failure and so on. The G-10 has a 'Galland hood' and they used it for training; that was the easiest one to fly, and I'll tell you why. Number one, the 'Galland hood.' It's not like a Mustang, but you can see better out of it. But I didn't like the look of it. By that time I could afford to be that fussy, because I'd flown the G-6 for years and years. The tailwheel is another thing that looks like shit! But, OK, that's my opinion... If you were coming up from scratch, the G-10 is the easiest. If you've flown the G-6 for years, none of that helps."



BELOW: While acknowledging it was easier for a novice to fly than other versions, Walter wasn't keen on the appearance of Bf 109 G-10 'Black 2'. This aircraft had previously been the first Buchón he flew, D-FEHD, and was converted by Hans Dittes. DR ANDREAS ZEITLER

In 2007, Walter and the Bf 109 G-6 were contracted to appear in Valkyrie *alongside John Romain and Cliff Spink in Tom Blair's Buchón. They largely flew from Löpten, a disused former East German base.*

"It was great fun. We were flying into this strip in the middle of the woods. There was no hangar, no gas pump, no nothing, but we got excellent food. Tom Cruise came out there the first day and we were all sitting out in the woods eating from little trays... He told me he was most interested in the Messerschmitt I was flying. The heat was terrible, 36°. One day we couldn't land for about 20 minutes because one of the extras in German uniforms had passed out

LEFT:
A last Hahnweide display in the Harvard, a few months before he sold it to the Flying Bulls. BEN DUNNELL

and there was an ambulance on the runway."

He also liked Bf 109E-4 'White 14,' which he flew in Canada for its then owner Ed Russell.

"The wartime pilots loved it very much, and I would say it's the easiest to fly [with experience]. It's quite a bit lighter and it has less power. Of course, power is good, but it can be used against you if you don't handle it right."

◆

Walter retired from Lufthansa at 60 as a Boeing 747-200 captain, and after a few years' extension beyond his 70th birthday, he stopped flying the EADS Bf 109s in 2009. But he kept displaying alongside his son Toni, also a commercial pilot, in a duo they carried on for many seasons. It took numerous different forms: the pair of Harvards, both sponsored by Red Bull, was the best-known, but a Soko Galeb and an L-29 Delfin also entered the mix, and latterly they performed in Extra EA330LTs. After Toni sold his Harvard, Walter retained his. The last time I saw him perform was at the Hahnweide in 2019, by which time Walter — still looking almost totally unageing — was 83. By now he was mandated to have a safety pilot with him, but he had lost not one iota of his skill in that aeroplane. He put on a faultless exhibition of aerobatics.

The following year, Walter sold the Harvard to his Salzburg-based friends at the Flying Bulls. But he was still very much a presence on the scene. Notably, as German warbird owner-pilot Georg Raab expanded his Flying Legends collection at Siegerland Airport, his long-time friend continued to be a regular visitor. In 2021 Walter took the controls of Raab's P-51D *Frances Dell* and, with safety pilot again on hand, executed an aerobatic sequence. The hangar in which Raab keeps his fleet was named after Walter during 2023, and when Spitfire IX MH415 arrived this March, he was on hand to watch. On hearing of his death, Rod Dean — who also flew in *Memphis Belle* — said, "I really liked Walter. What a character". Indeed he was, in the best sense, and one who leaves the world of historic aviation much rewarded by his decades of involvement.

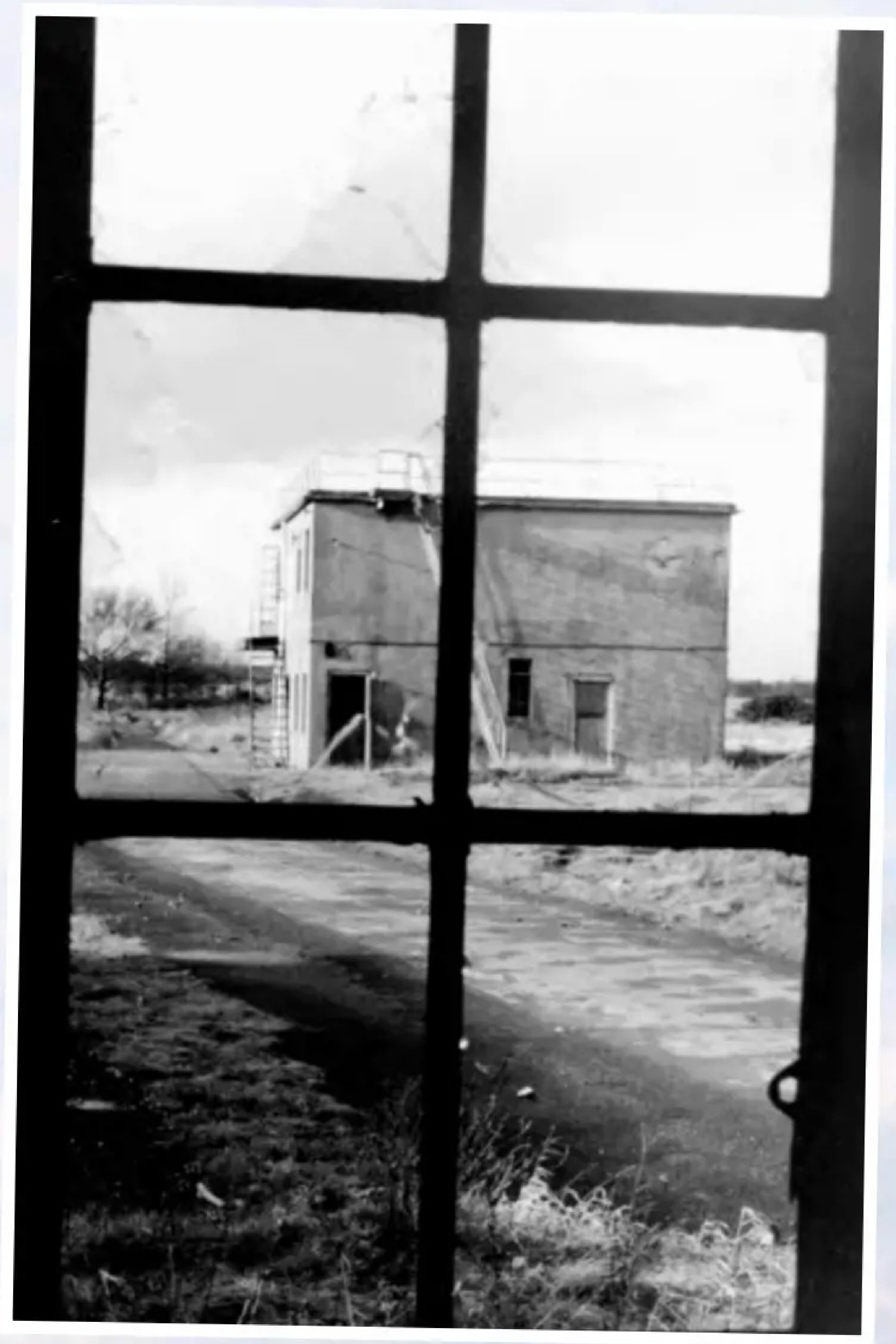
LEFT:
Walter was on hand to welcome Georg Raab's Spitfire MH415 to the Siegerland Airport hangar that bears his name. VIA GEORG RAAB

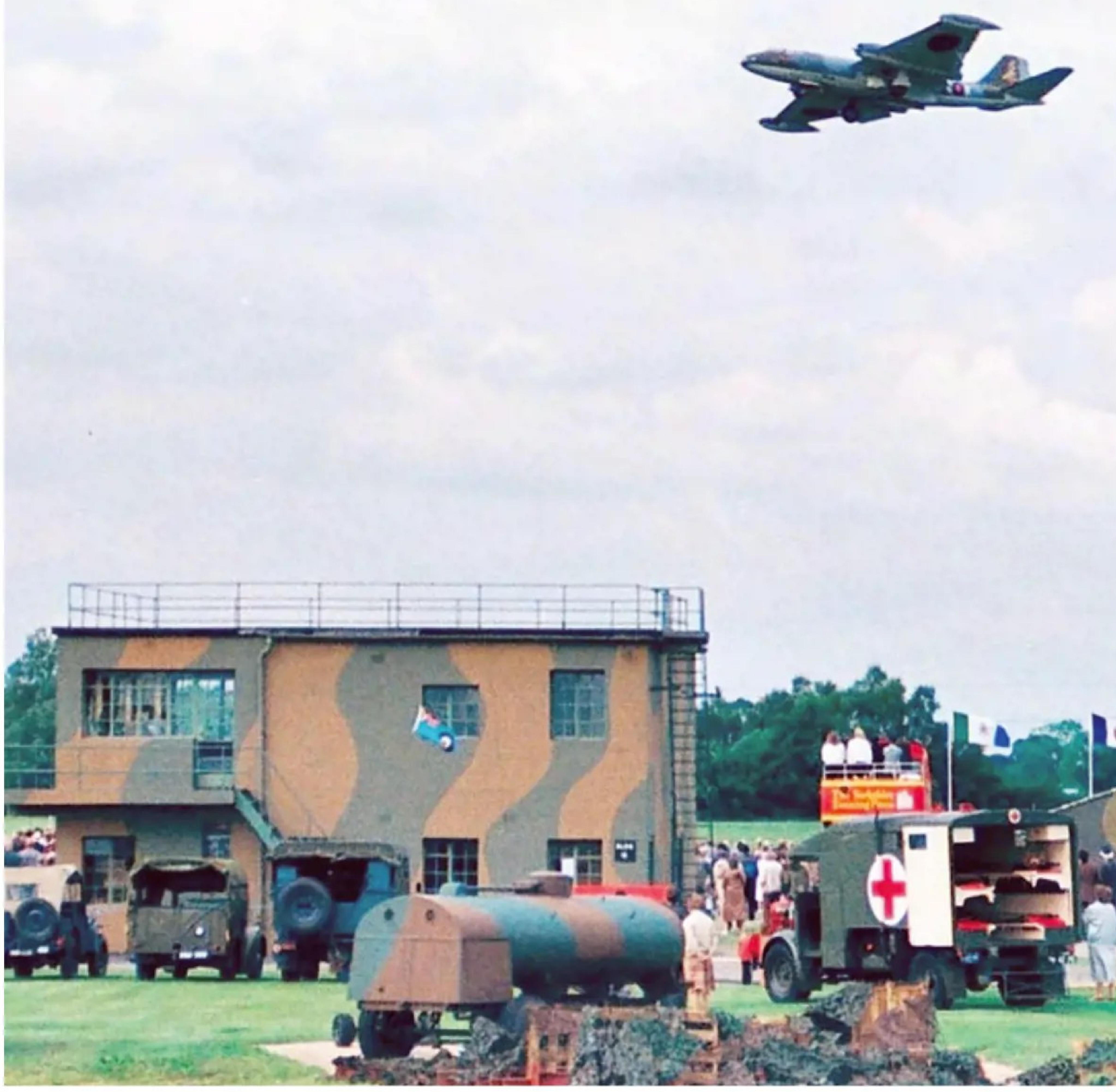
ELVINGTON'S EARLY YEARS

This year sees the excellent Yorkshire Air Museum at Elvington celebrating its 40th anniversary. With these images of its formative first decade, **Mick Britton** charts its progress

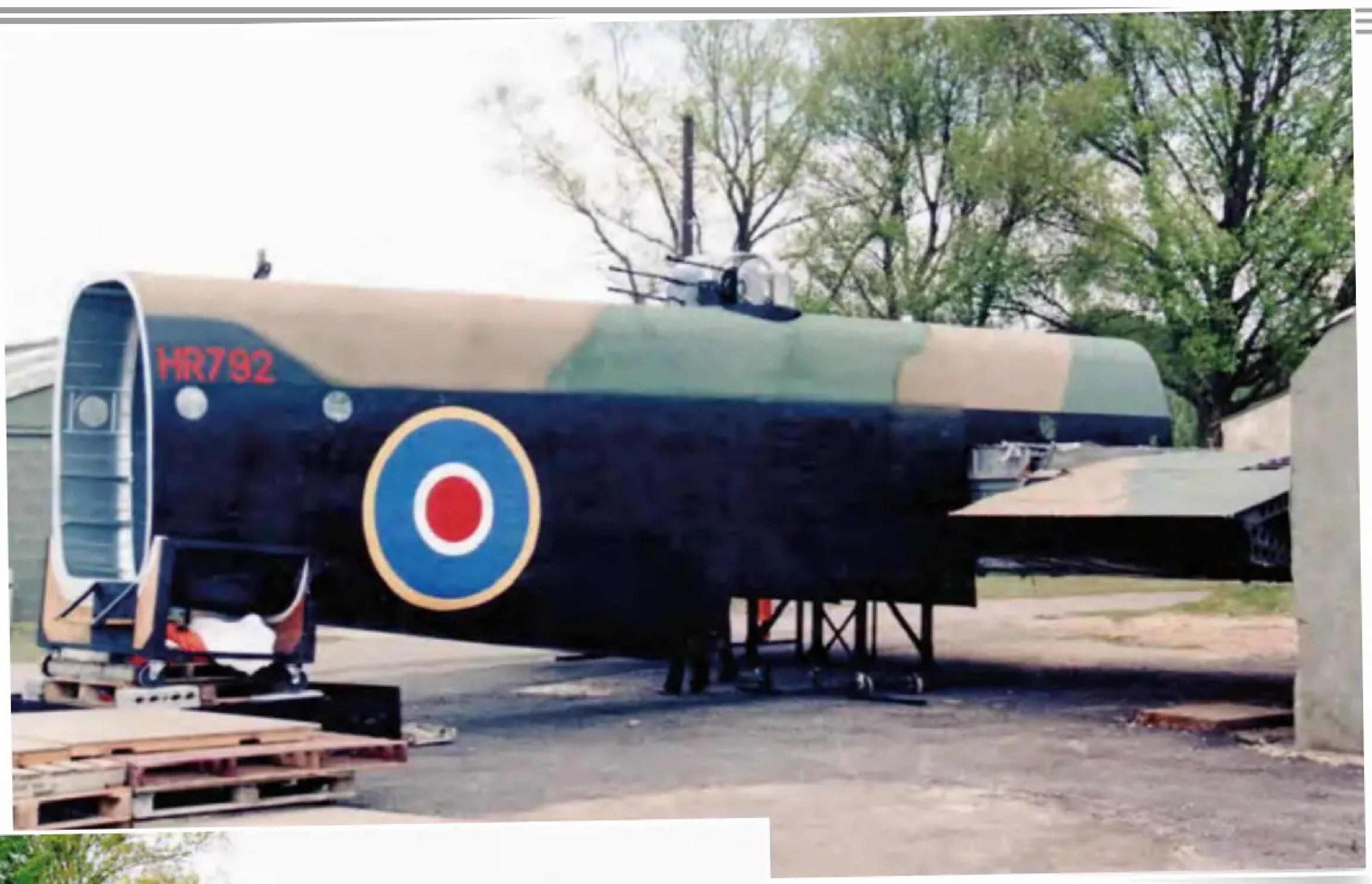
LEFT:
The site was in neglected condition circa 1984, prior to the YAM's foundation. This view of the control tower, bearing an RAF badge applied by a film company some years previously, was taken from one of the dilapidated buildings which, fully restored, now houses the museum archives.

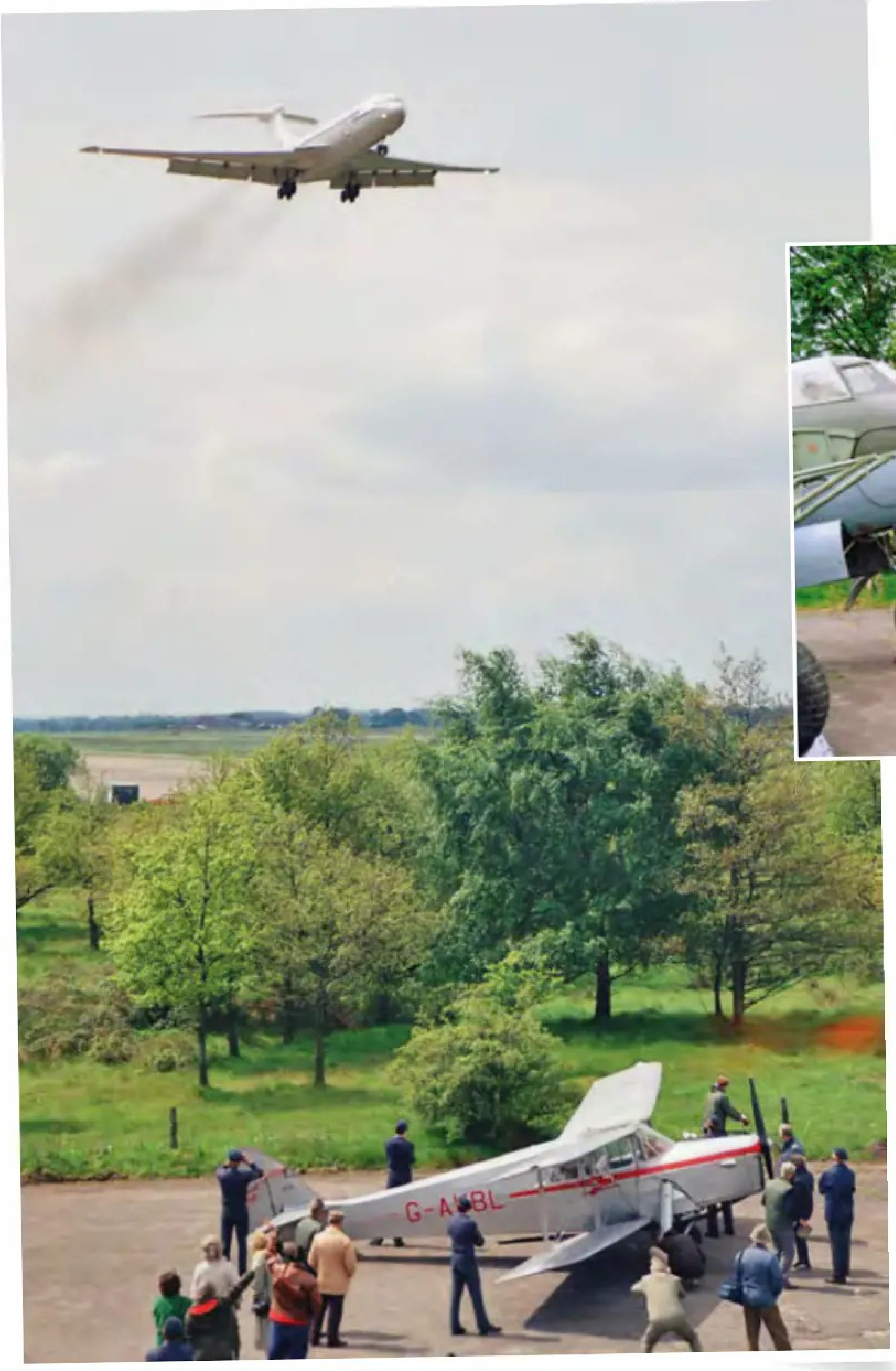
BELOW:
One of the YAM's best open days for flypasts was Canada Day, the No 6 (Canadian) Group reunion in August 1990, which included a Canberra TT18 of No 100 Squadron. This unit was a regular open day participant.

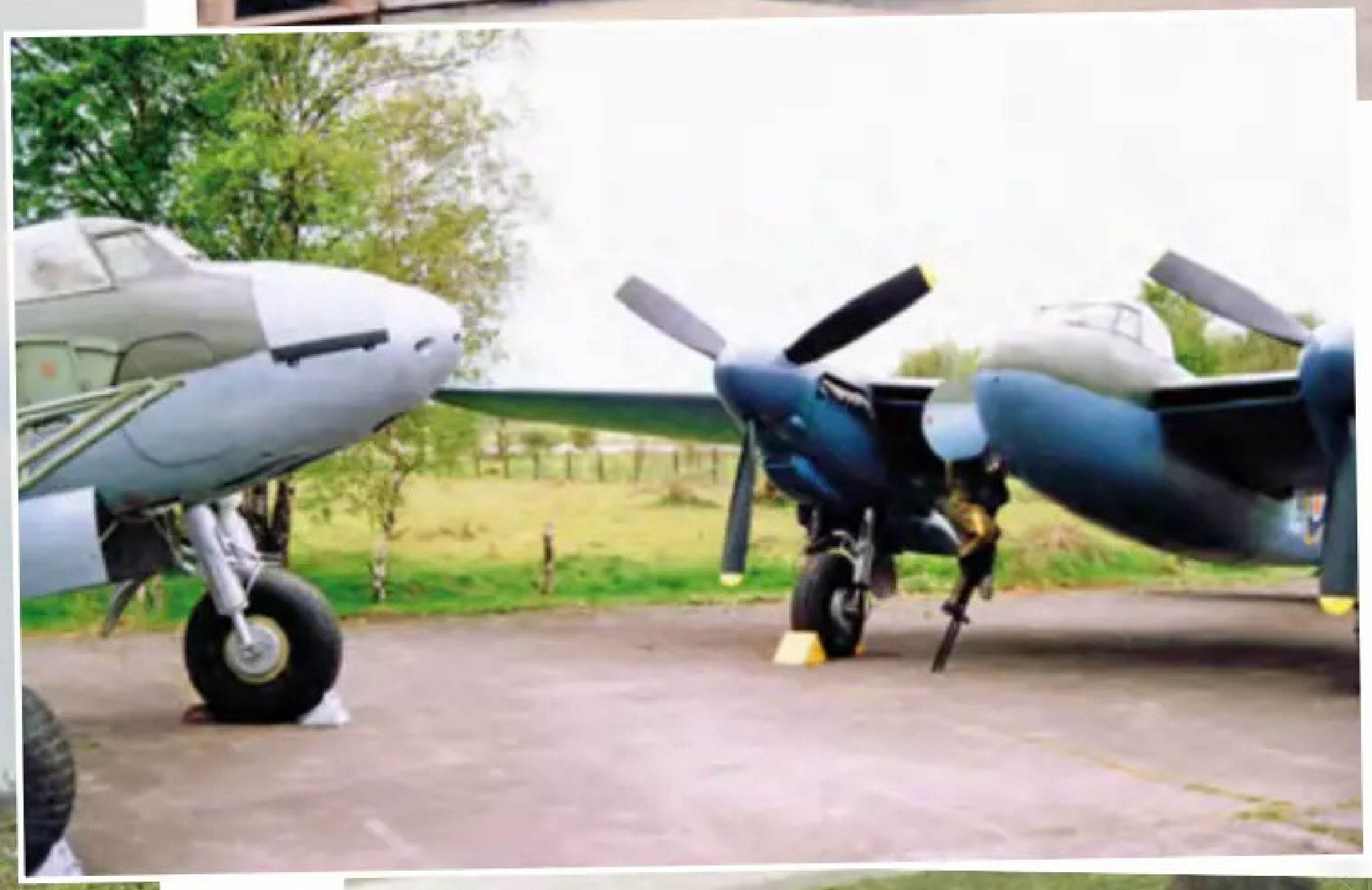




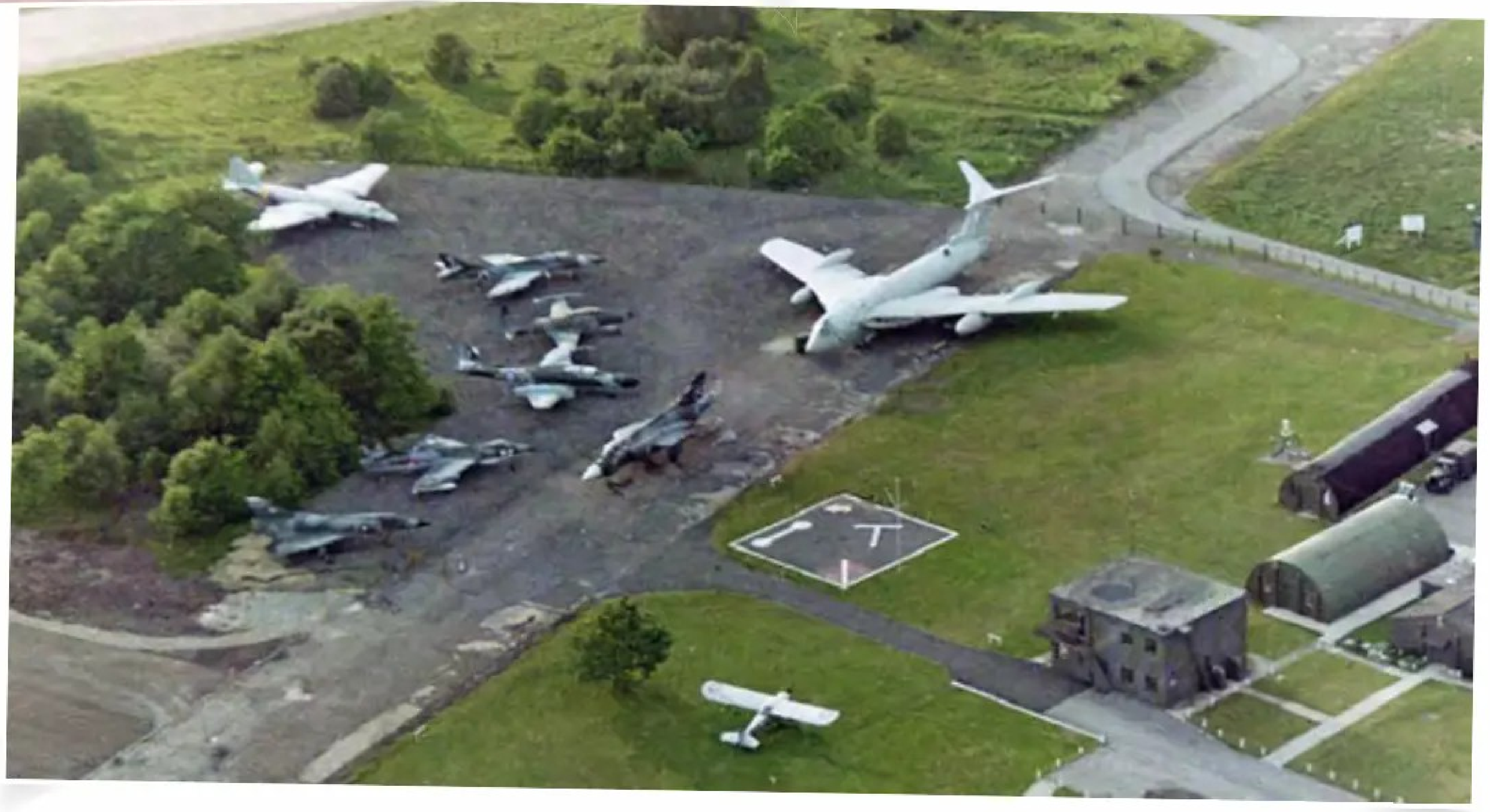
RIGHT: The completed first stage of the Halifax rebuild based on the original mid-fuselage section that formed part of Halifax GRII HR792 of No 58 Squadron, which crashed in January 1945 on the Isle of Lewis and was used there as a chicken shed. It was unveiled at the 1988 open day; the following year the rear fuselage section, complete with rear turret, would be added.





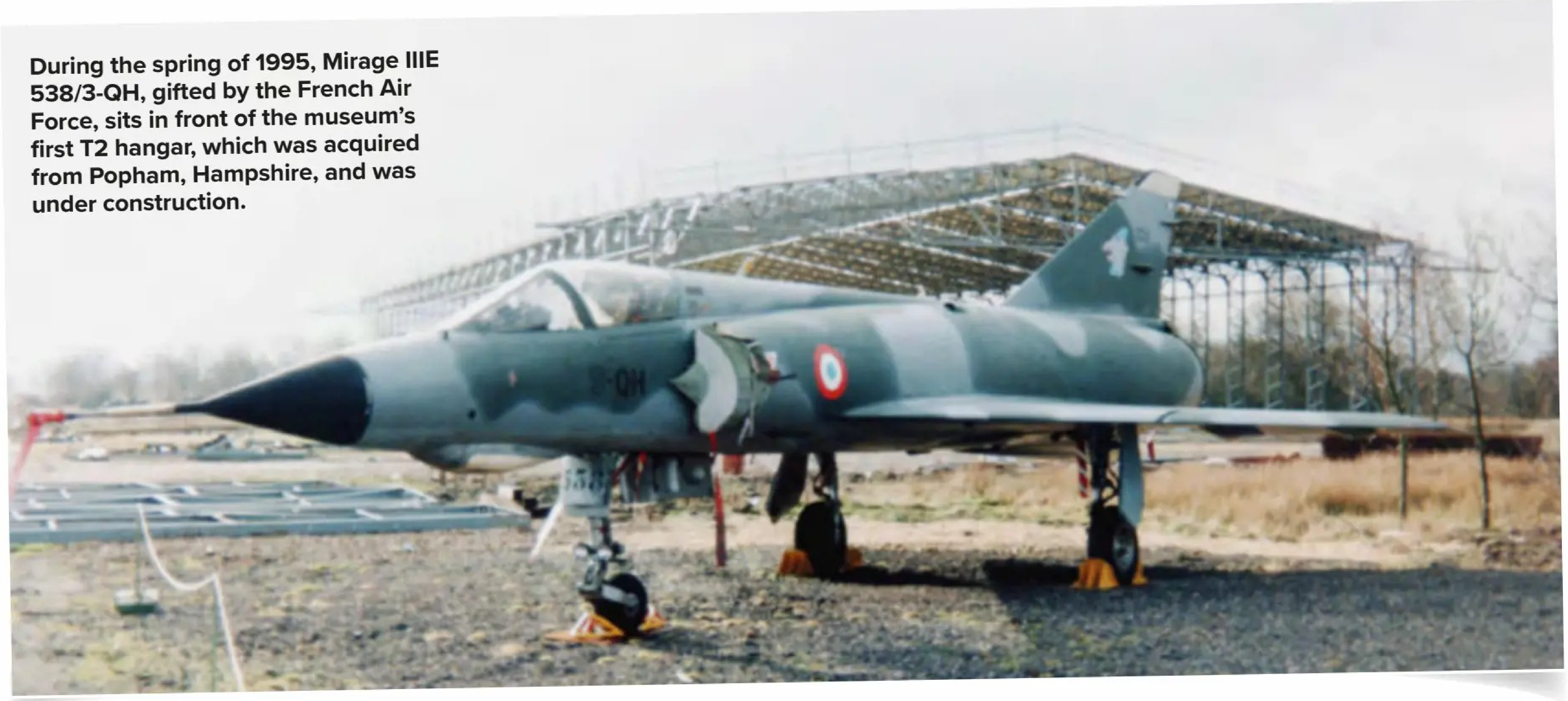


LEFT: The 1991 open day that featured the roll-out of Tony Agar's Mosquito NFII HJ711 attracted British Aerospace's Mosquito TIII RR299, and provided a unique opportunity to photograph the two together. The latter was subsequently lost in a crash at Barton in 1996, while HJ711 resides with the Lincolnshire Aviation Heritage Centre at East Kirkby.



ABOVE: One of a number of flypasts which took place at the 1988 open day was by a VC10 C1 from No 10 Squadron. DH Hornet Moth G-AHBL was a welcome visitor on the ground.

ABOVE: An aerial view of the YAM's growing aircraft collection, including newly arrived Buccaneer S2 XX901 in the centre, still being reassembled in the summer of 1994.



During the spring of 1995, Mirage IIIE 538/3-QH, gifted by the French Air Force, sits in front of the museum's first T2 hangar, which was acquired from Popham, Hampshire, and was under construction.

Have you got photos to contribute to Personal Album? If so, e-mail the editor at ben.dunnell@keypublishing.com

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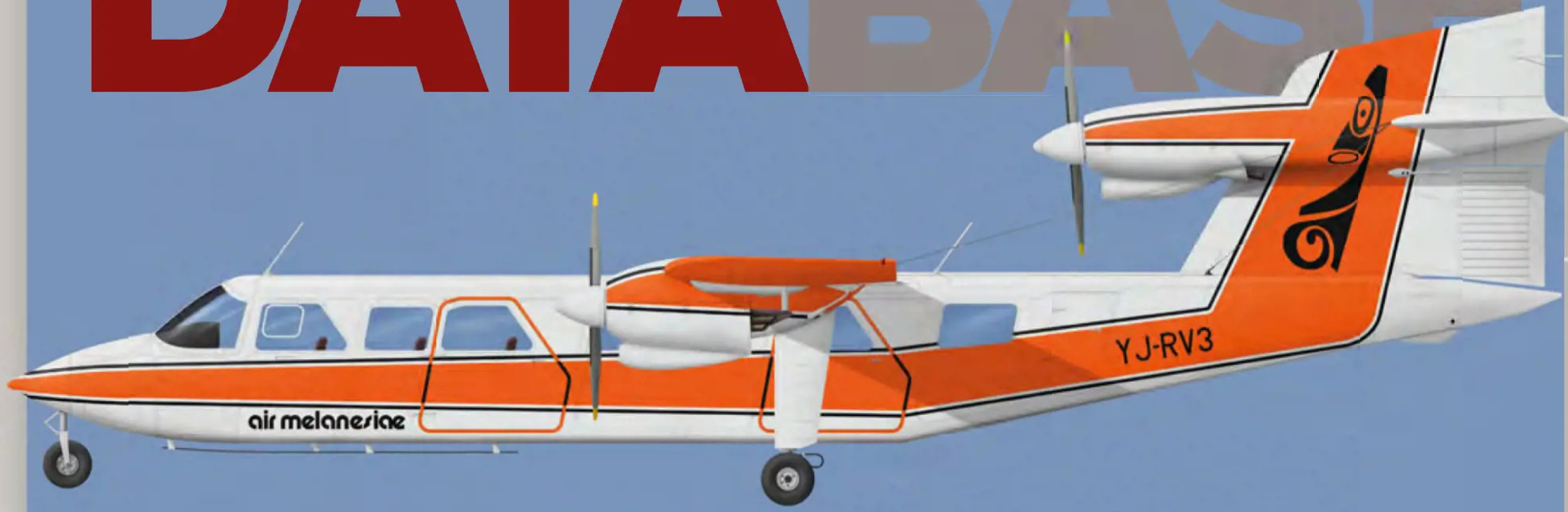


BRITTEN-NORMAN TRISLANDER

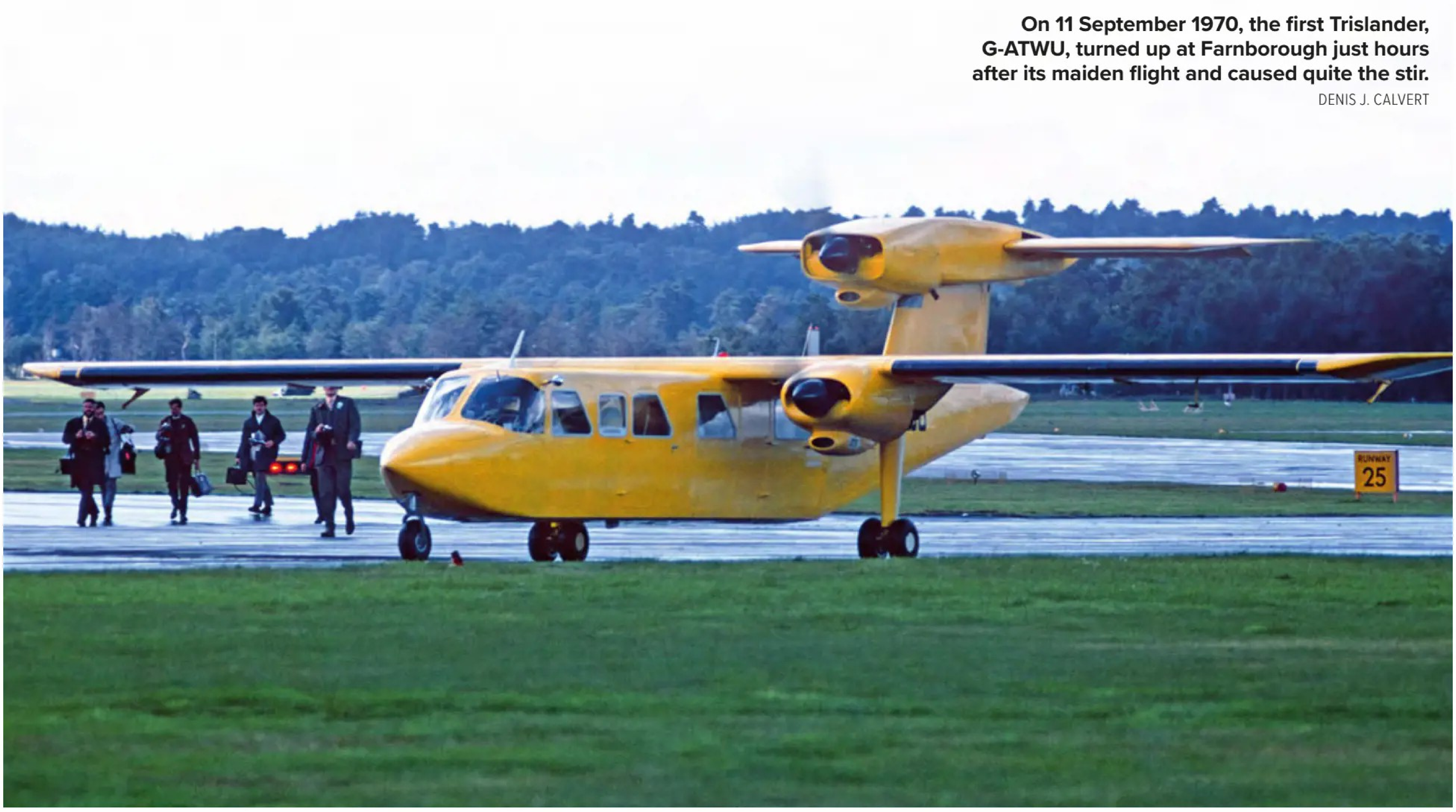
WORDS: MATTHEW WILLIS

13 IN-DEPTH PAGES

TOP:
Air Melanesiæ of Port Vila, Vanuatu operated Trislander YJ-RV3 on its services around the 83 islands of this South Pacific territory. CHRIS SANDHAM-BAILEY

MAIN IMAGE:
Aurigny's home island of Guernsey provides the backdrop to its G-BEPI, which later became G-FTSE in deference to the Channel Islands' financial services community. KEY COLLECTION

A spectacularly unusual design that surprised the world

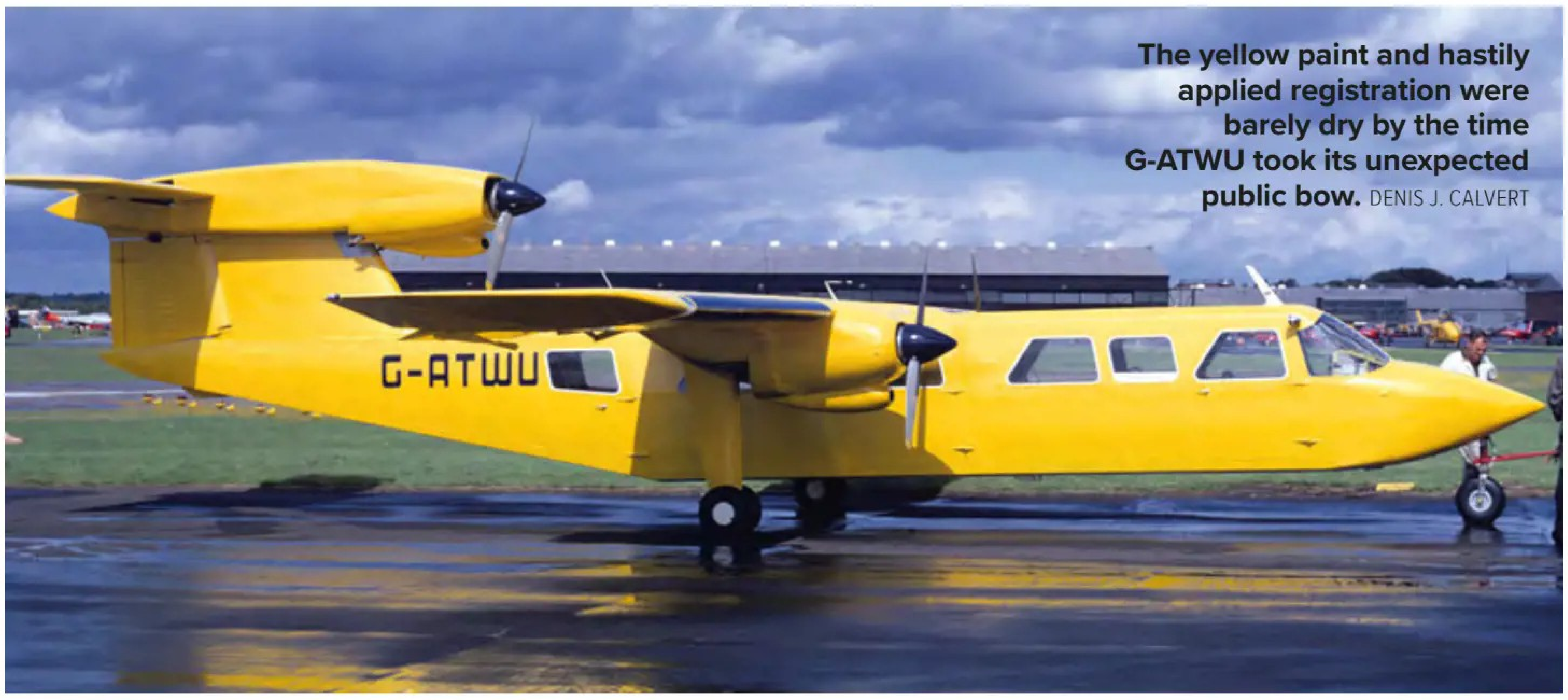


On 11 September 1970, the first Trislander, G-ATWU, turned up at Farnborough just hours after its maiden flight and caused quite the stir. DENIS J. CALVERT

The Britten-Norman BN-2A MkIII Trislander appeared to spring from nowhere to a surprised audience. The three-engined, 17-seat light airliner was a natural and practical evolution of the BN-2 Islander twin, addressing an obvious gap in the market. And yet, typically, Desmond Norman and John Britten produced it in a way that caught the aviation world off-guard.

Britten-Norman was formed in 1953 and, apart from a one-off ultralight, initially concentrated on converting existing aircraft for agricultural use. In the early 1960s, however, the company spotted a niche for a modern equivalent to the DH Dragon Rapide and developed the BN-2 Islander, to carry nine passengers plus the pilot.

Soon after the Islander first flew in 1965, Britten and Norman started to consider the possibilities offered by a larger aircraft. The Islander was ideal for a great many 'third-level' commuter airlines in most parts of the world, but its capacity of 10 passengers and a disposable load of 1,700-1,900lb left room for improvement.

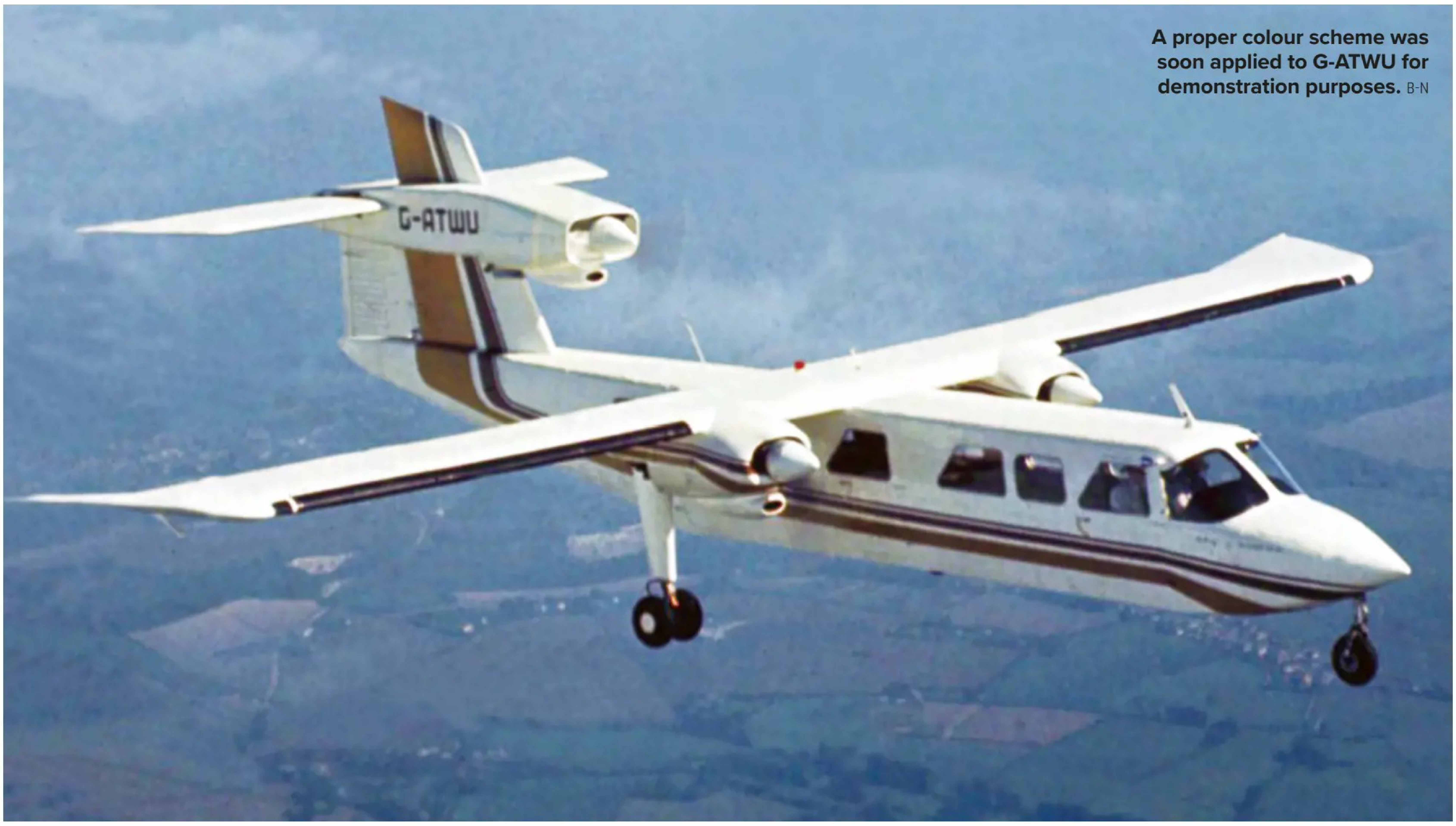


The yellow paint and hastily applied registration were barely dry by the time G-ATWU took its unexpected public bow. DENIS J. CALVERT

Before the Islander had even gone into full airline service, Britten and Norman considered a variety of schemes for a follow-up. The most ambitious was a scaled-up BN-2 to fulfil the much-pursued 'DC-3 replacement' role, and dubbed the Mainlander. Initially, though, a simple stretch of the Islander was the favoured option. After the Islander received its type certification in April 1967, development aircraft G-ATWU was at a loose end. Late that year, it was brought into the factory and given a fuselage plug of 33in to increase its passenger capacity to 14, becoming the BN-2A MkII Islander Super. G-ATWU first flew in this form on 14 July 1968.

The Super did not proceed to production, with various reasons given. The US authorities were apparently not keen to approve a type with bench seats that accommodated more than the Islander's 10 passengers. More serious was the single-engine performance, and testing suggested much greater development would be needed to satisfy regulators in that regard.

B-N curtailed the Super programme and considered its options. Stretching the Islander remained attractive but a sticking-point was power. Replacing the two Lycoming O-540 engines with more powerful units was considered, as was moving to four engines of lower power. There was no ideal option for an up-engined twin, and the four-engine scheme came with significant drawbacks. As test pilot Hugh Field of *Flight* remarked, "this solution did not appeal at Bembridge. It was felt that not only was this likely to make an undesirable increase in basic weight, but, and this consideration was overriding,



A proper colour scheme was soon applied to G-ATWU for demonstration purposes. B-N

the first cost of the aircraft would be pushed unnecessarily high by the installation of four engines, propellers and associated ancillaries". A further disadvantage would be that the good engine-out performance of the Islander, which had its two engines set close to the fuselage, would be degraded.

Then, during a trip to the United States, Britten and Norman hit upon a solution that was obvious in the 1920s but for piston-engined aircraft had been all but forgotten: three engines. In 1971, Britten recalled, "the realisation that the world's transport aircraft safety requirements seemed to be designed to favour three-engined aircraft and the appreciation that a third engine would not only be relatively easy to install on an Islander but would give many practical advantages. The design that Desmond Norman and I sketched in a Chicago motel late in 1969 had obvious potential structural and aerodynamic problems. We felt that these could only be investigated quickly and economically by building a low cost prototype."

The usual layout of a trimotor, with the third engine in the nose, was unattractive for several reasons. It would have reduced the Islander's good view forward, and necessitated changes to the undercarriage at the very least. Instead, the layout adopted on several jet airliners of the 1960s, with the third engine at the tail, was adopted. The Islander's conventional tail was replaced with a 'T-tail', the engine placed at the junction of the fin and elevator. In most other respects, the aircraft was similar to the Islander, just lengthened. The constant-section box fuselage made it easy to extend. The basic design, led by Denis Berryman, was undertaken in just a few months.

Thus, G-ATWU was called upon again to be cut up and rearranged. In fact, at this point, the prototype trimotor was simply regarded as a 'proof of concept' design. Britten and Norman expected the "potential structural and aerodynamic problems" suggested by the layout would require a more extensive redesign. In fact, when the re-rebuilt G-ATWU flew at 06.45hrs on 11 September 1970 with John Britten, Desmond Norman and Andy Coombe aboard, Britten recalled, "To our delight it turned out to be almost completely trouble free."

The Trislander's design focused on simplicity, ease of maintenance and load-carrying ability for its size. Its wing was identical to that of the Islander, with the extended wingtips as standard. The wing loading and span loading were higher than those of the twin but still low enough that the spars would have all but unlimited life. The third engine on the centreline improved engine-out characteristics even further, while the extra power enabled the addition of a 6ft extension to the fuselage on top of the 33in already added to the Super.

> *"The design focused on simplicity and load-carrying ability"*

The design and prototype reconstruction took place with no fanfare, but with a view to making a dramatic entrance. When the Islander was due for its first major UK public appearance at the SBAC display at Farnborough in 1966, B-N had pulled out all the stops to finish the second aircraft so as to put on a notable formation show. In 1970 it sought to do the same, once again exhorting staff to work around the clock to complete the new trimotor so B-N could once again upstage the big players. It was a big ask — metal was first cut just eight weeks before the show.

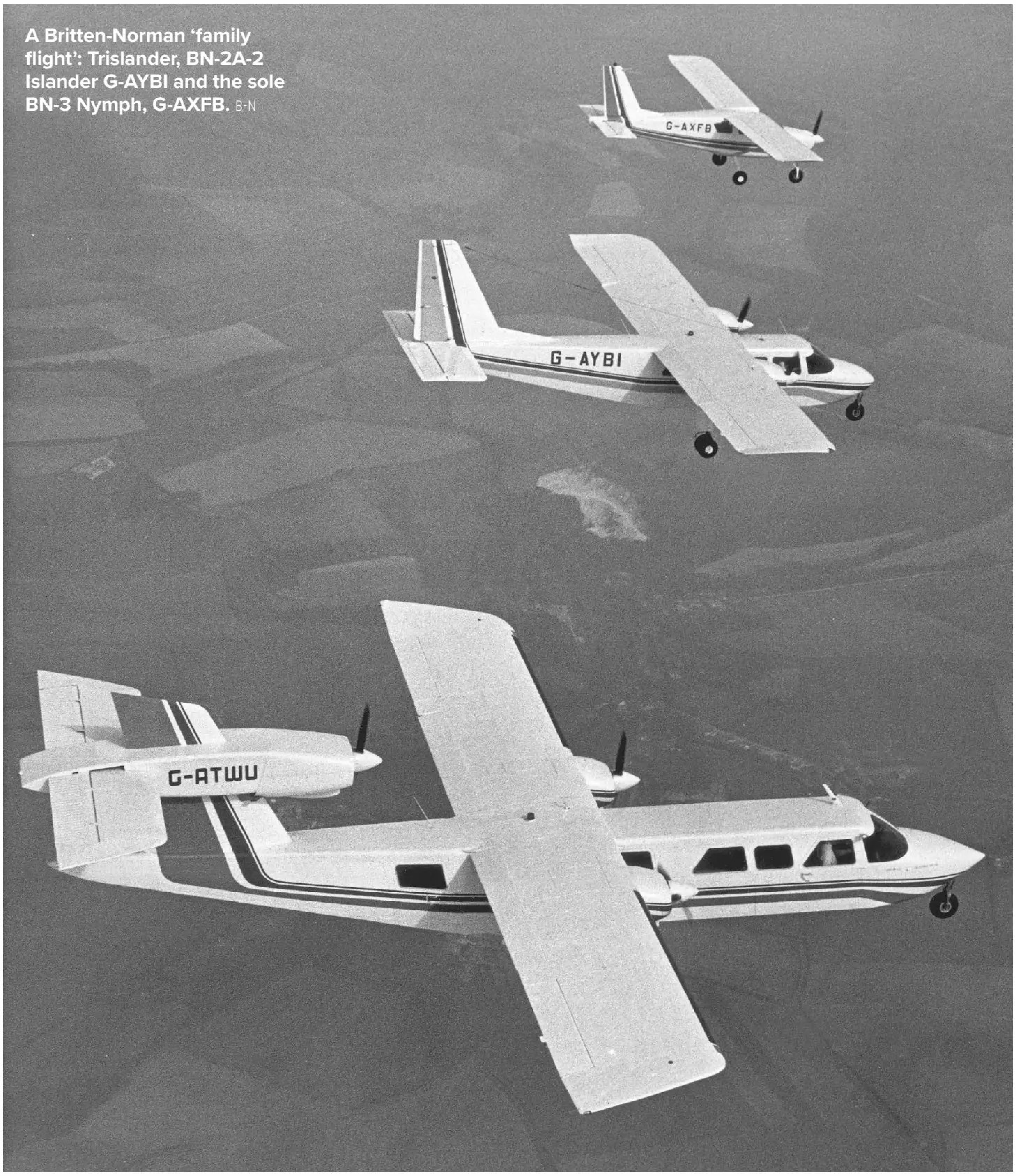
Test-flying showed great promise, though there were some shortcomings to address. The fin as designed did not provide sufficient directional stability. Initially a small, fixed fin was added to the top of the engine cowling, and later this was extended aft to the line of the rudder trailing edge. With the definitive layout, the engine nacelle was no longer at the top of a 'T-tail' but in the middle of a cruciform tail, the rudder located between the tail-cone and engine nacelle. The tailplanes were mounted directly to the aft part of the nacelle.

The autopilot took a fair amount of work to perfect, as the amount of control movement required to effect pitch change led to delays in response and the autopilot struggling to keep up. Test pilot Hugh Townend recalled that during trials at Hurn, "To anyone watching on from the ground it must have been a remarkable sight, as this aircraft 'porpoised' its way towards the ground!"

Other than niggling problems, however, the Trislander was ready remarkably quickly. B-N's gambit succeeded, and when the team turned up at Farnborough with G-ATWU on 11 September it had the satisfaction of astounding the industry and public with an aircraft nobody had expected — the first British piston trimotor since the 1930s, to boot. It was on its third flight of the day, the second having gained Air Registration Board approval. In *Flight*, Hugh Field described this as "one of the biggest surprises of the 1970 SBAC Display."

Field added, "the philosophy of the Trislander is so simple that one wonders why something of this kind has not been tried before". It had, of course, with the trimotors of old, in some cases adding two engines to a single-engine design as in the Fokker F.VII and Junkers Ju 52, or developing a twin with three engines of lower power, like the de Havilland Australia Drover.

As a hand-built prototype, G-ATWU was not fully representative of the production aircraft. It was retired once the development flying programme was complete and became a static structural test airframe. For certification, a new Trislander was built, taking an Islander from the production line and modifying it accordingly. The cockpit naturally had to be slightly redesigned to accommodate three sets of engine controls instead of the Islander's two, while B-N took the opportunity to make some improvements to the control yoke.

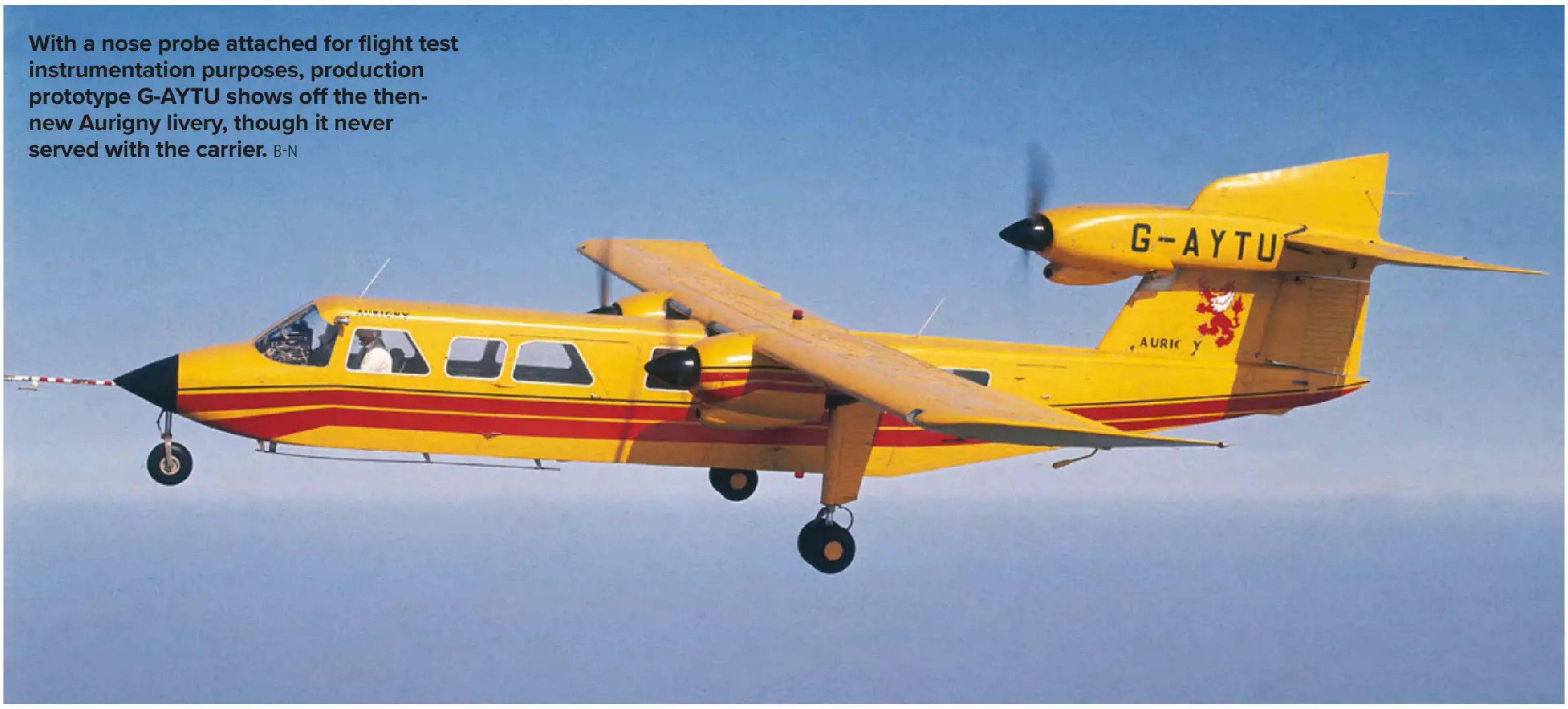

A Britten-Norman 'family flight': Trislander, BN-2A-2 Islander G-AYBI and the sole BN-3 Nymph, G-AXFB. B-N

This aircraft was registered G-AYTU and painted in the colours of the Islander's first commercial operator, Aurigny Air Services, the Channel Islands commuter airline. When Hugh Field tested it in 1971, he remarked, "No Islander pilot is likely to have the slightest problem converting to the Trislander which thus offers operators an immediate increase of capacity with the minimum of logistic effort". Though the production prototype was painted in the yellow of Aurigny, G-AYTU never served with that airline, going to Air Gabon in March 1972 when its development work was done.

While B-N went through a wave of financial problems in 1971, interest in its aircraft remained high. During the last two months of the year, two Trislanders were delivered to customers alongside 10 Islanders and the first Defender military adaptation. Initial production, as with the Islander, took place at the Bembridge factory and at Intreprinderea de Reparatii Material Aeronautic (IRMA) in Romania. The acquisition of B-N by Fairey Aviation in 1972 saw manufacturing being moved to Gosselies in Belgium, with Bembridge retained for design, development, finishing and customisation.

As with the Islander's early production period, B-N made a number of minor but important refinements to the basic Trislander as time progressed. The MkIII-1 of 1974 increased the maximum permitted take-off weight by 35lb, but the most useful and obvious development was a long nose, unveiled in 1975 with the MkIII-2 model. This provided an additional 28 cubic feet of cargo space and made the Trislander even more gawkily distinctive. The MkIII-3 introduced automatic propeller feathering.

A most unorthodox avenue of Trislander development was a response to US regulations regarding the loss of an engine during take-off at full load. In August 1976 G-BDTR, a BN-2A MkIII-2, was modified with the addition of a Canadian Bristol



With a nose probe attached for flight test instrumentation purposes, production prototype G-AYTU shows off the then-new Aurigny livery, though it never served with the carrier. B-N

Aerojet 12NS-350CBA rocket motor behind the centre piston engine. This installation was tested at the Royal Aircraft Establishment in October that year. The rocket provided 350lb thrust for emergencies, and was made available as an option, aircraft in that specification being designated BN-2A MkIII-4.

Interest in the Trislander was steady but unspectacular, and two periods of financial difficulty in the 1970s, followed by changes of ownership, perhaps held sales back somewhat. Pilatus bought B-N in 1978, and production moved back to Romania. Construction of Trislanders continued until 1984, when the last aircraft was sold to the Botswanan military. A restart of production was often mooted but never fully came to pass.

A second life?

Nevertheless, a set of 'kits' for a stillborn licence-production scheme in Florida involving the Homestead-based International Aviation Corporation were produced in the 1980s. Only three aircraft were completed, the remaining kits remaining in storage until November 1995 when Aurigny's partner maintenance organisation, Anglo-Normandy Aero Engineering, acquired two. Anglo-Normandy succeeded in building these kits without instructions of any kind, due to its expertise from years of operating the B-N types, which included 're-lifing' Trislanders by replacing the wing. The first effectively new Trislander since 1984, G-BAXD, flew in March 1996. This machine reused the registration of a previous Aurigny aeroplane of 1973 vintage, leading to later confusion between the two, though with the agreement of the CAA it was zero-timed.

In 2004, B-N said, "There is a strong international demand for the unique Trislander [...] and we have several clients who have asked for options on factory-refurbished Trislanders as and when they become available", noting that it was at that time, "the world's only single-pilot operated, three-engine civil aircraft capable of carrying 17 passengers". The possibility of producing new Trislanders to replace Aurigny's worn-out examples in the mid-2010s was considered, and yet another production restart was proposed in 2022, though in the end the regulatory difficulties were considered too onerous.

Modest development of the Trislander continued as late as the 2010s, in an effort to make the aircraft slightly more tolerable to a modern audience. To moderate cabin noise, Aurigny changed the propellers on its Trislanders' wing engines to three-blade, constant-speed Hartzell HC-C3YR-2UF/FC8468-8R units, which also allowed a useful increase in maximum take-off weight. The three-blade propellers made little difference to cabin noise, unfortunately, and the retention of a two-blade propeller on the centreline engine reduced the effect still further. They did, however, give the Aurigny Trislanders a unique sound externally, making them instantly identifiable in comparison with those of other operators and the otherwise similar-sounding Islander. ➲

DATAFILE

TOUGH LUCK

The strength and safety of the Trislander airframe was inadvertently demonstrated in South Africa during October 1977 when ZS-JYF crashed during a display flight at Lanseria, the pilot and passenger mercifully surviving. Peter Phillips was known for impressive performances in the Islander and Trislander. Possibly caught out by unusually hot conditions, Phillips began a wingover with marginal height and ZS-JYF struck the runway on the pull-out. The impact drove the main undercarriage legs into the engine nacelles, and the port engine broke off altogether while the starboard hung off the wing pointing downward. The Trislander bounced back into the air, and, remarkably, climbed a short way under the power of the still-running tail engine, giving Phillips time to lower the flaps and raise the nose before the second, final impact. The Trislander came to rest substantially intact. Phillips and his passenger, B-N sales pilot Mike Wrigby, were injured but escaped alive.

Flying with Kondair in 1986, G-BCCU was on a Stansted-to-Amsterdam newspaper delivery service with only the pilot on board. Around 40 miles off Clacton, he fell asleep and was awoken by a bump. The Trislander had struck the water, which knocked off the starboard undercarriage leg. A forced landing was made at Stansted with very little damage, and G-BCCU was repaired and returned to use.

TECHNICAL DETAILS

Yes, it looked odd, but the Trislander was a triumph of design ingenuity

DATAFILE — SPECIFICATIONS: BN-2A MkIII-2 TRISLANDER

DIMENSIONS	
Length: Span: Height:	49ft 3in (15.2m); MkIII-1: 45ft 9in (13.9m) 53ft (16.15m) 14ft 2in (4.3m)
WEIGHTS	
Empty: Maximum:	5,842lb (2,650kg) 10,000lb (4,356kg)
POWERPLANTS	
Three Lycoming O-540E six-cylinder air-cooled piston engines, 260hp each	
PERFORMANCE	
Maximum speed: Stalling speed: Landing distance: Climb rate:	166mph (267.1km/h) 57.5mph (87km/h) 850ft (259m) 980ft (299m) per minute

The BN-2A MkIII Trislander is an all-metal, semi-monocoque, piston-engined trimotor light passenger and transport aircraft of high-wing configuration with a fixed tricycle undercarriage. It typically operates with a single pilot. The airframe is substantially similar to that of the BN-2 Islander twin, to the extent that the only fully new section was the tail assembly, which included the centre engine. The fuselage was lengthened and the wing structure strengthened from those of the Islander.

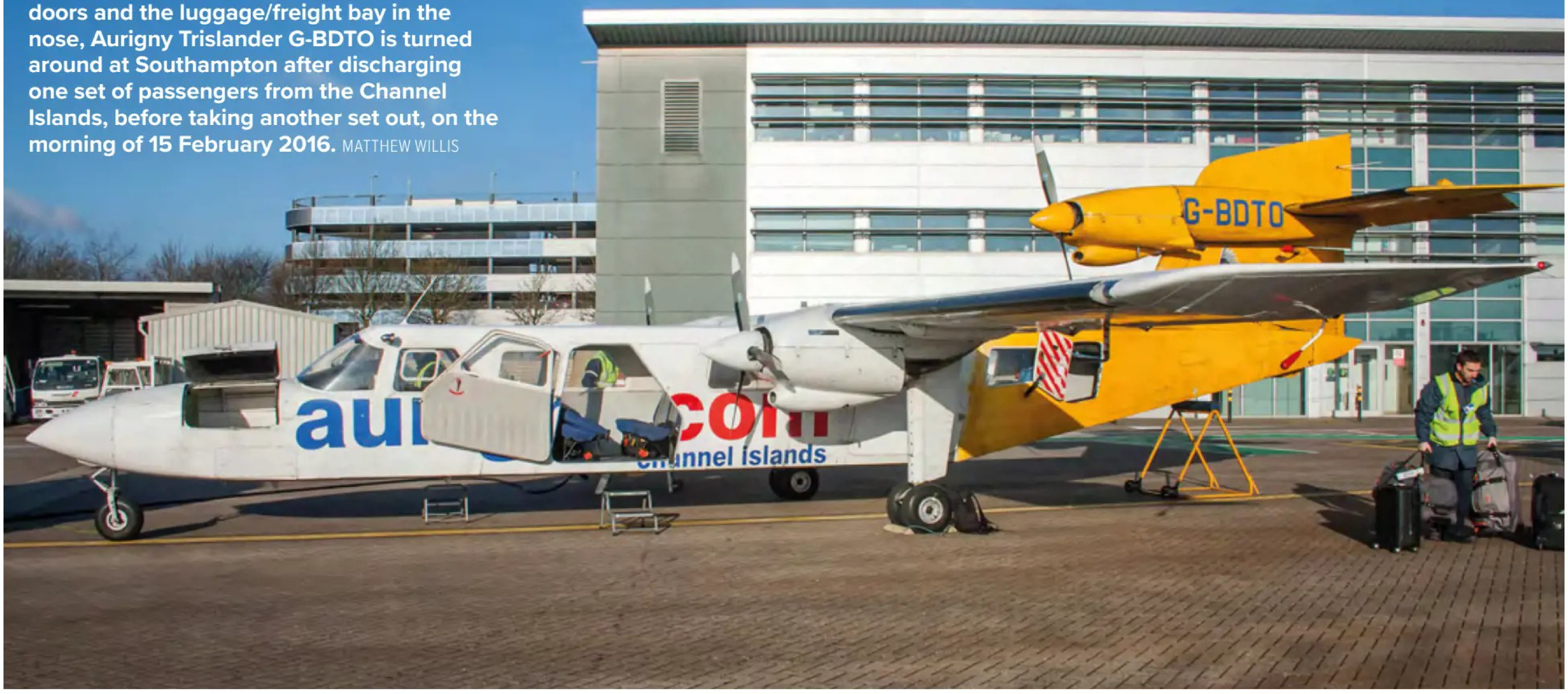
The fuselage is a simple box section with a longitudinal member at each corner bearing most of the load. This was an innovation of the Islander which allowed large doors in the flanks for ease and speed of access for freight and passengers, and to dispense with a central aisle. It simplified the interior, allowing straightforward bench seats in the passenger cabin, while reducing frontal area and consequently improving performance. It also meant the fuselage could be stretched and more doors added without compromising structural integrity. This was rendered even simpler by the fact that the stretch could be made by taking two existing Islander centre fuselage sections, removing the forward bay of both and joining them together, with a new upper skin grafted to the forward part.

The wing was of identical external form to that of the Islander, of constant NACA 23012 section, with no dihedral apart from the upswept, raked tips. As standard, these had the form of the extended wingtips carrying additional fuel tanks that were optional on the Islander. The wing spars and centre-section received further internal strengthening.

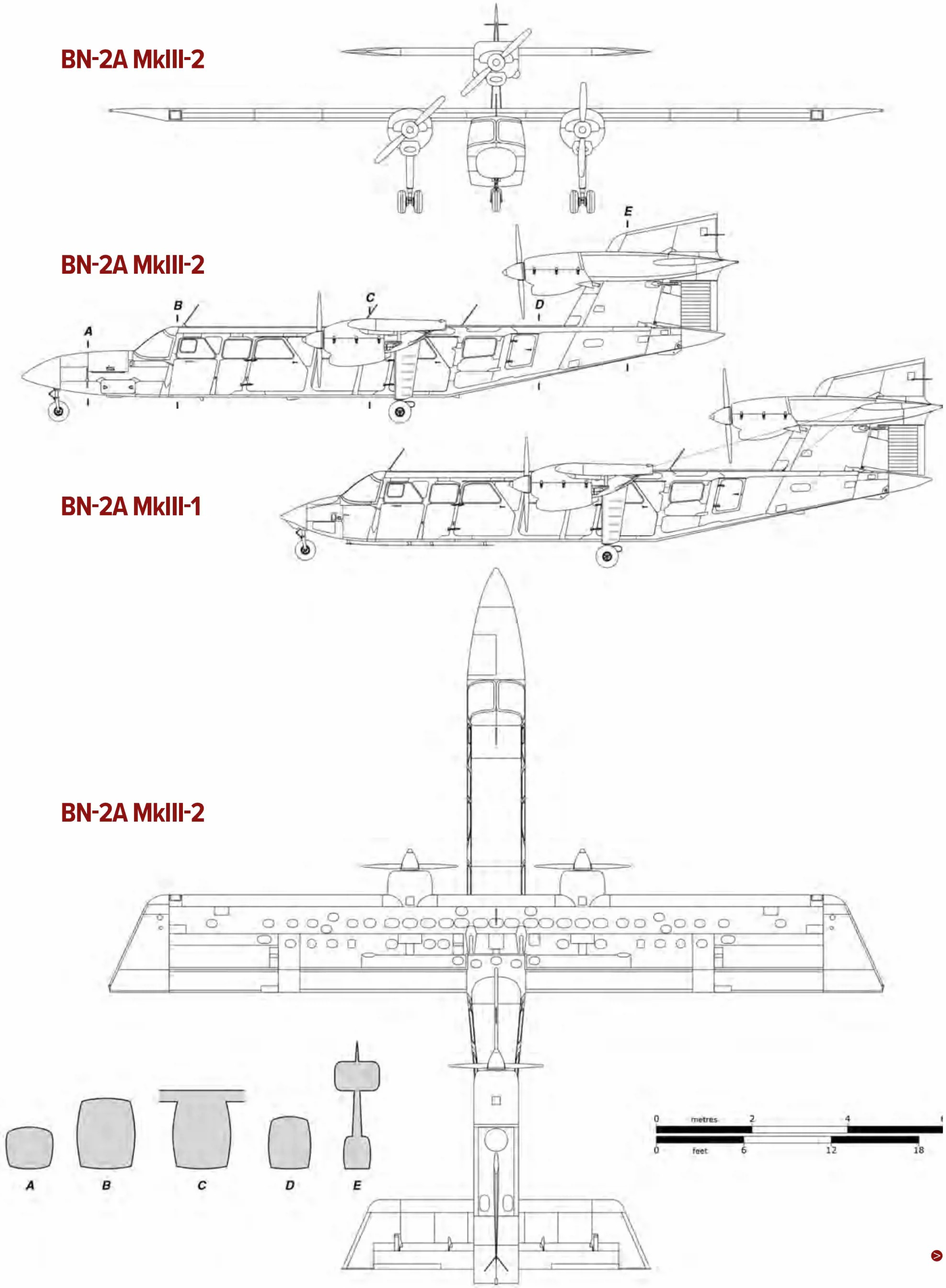
While the Islander effectively had unlimited fatigue life, the increased loading of the Trislander imposed limits on the wing of 30,000 hours of flight or 70,000 cycles of operation, whichever came first. Trislanders could however be relifed by replacing the wing, and this was often done in service. The aircraft was so straightforward that even major operations like wing replacement could be done by the operators themselves, further saving time and cost.

Fuel tanks were located in the middle of each wing, between the spars. Freight and luggage was carried in the space behind the cabin, and from the MkIII-2 model in 1975, in a lengthened nosecone.

The Trislander sacrificed some of the Islander's short-field performance to gain significant extra space and payload. The take-off run was, at 1,290ft, slightly less than double that of the BN-2A-21 Islander's 665ft, and its landing run was 850ft, against the Islander's 450ft. These figures were still easily enough to operate out of most small airports and compared favourably with other aircraft in the class. The DHC Twin Otter, for example, required a take-off run of 1,490ft. In return, the Trislander could carry 17 passengers plus the pilot, and could safely fly at more than a third greater overall weight than the Islander. Such was the commonality of structure that any Islander could be rebuilt as a Trislander if required.



Showing well the large fuselage-side entry doors and the luggage/freight bay in the nose, Aurigny Trislander G-BDTO is turned around at Southampton after discharging one set of passengers from the Channel Islands, before taking another set out, on the morning of 15 February 2016. MATTHEW WILLIS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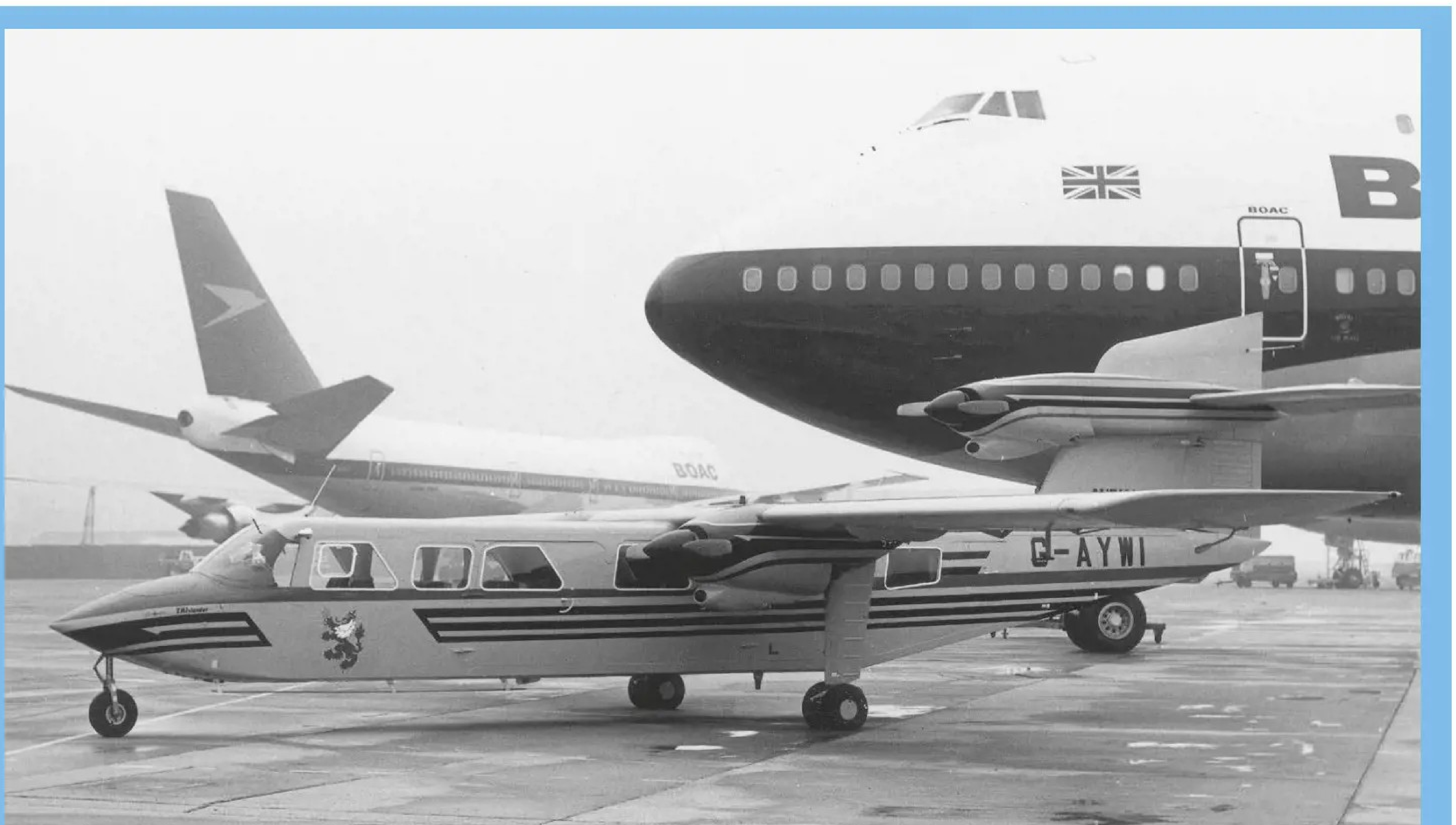
Channel Islands


Aurigny Air Services' first Trislander, G-AYWI, joins the queue for take-off after celebrating the award on 21 May 1971 of its certificate of airworthiness by making its debut at London's Heathrow Airport, alongside the new Boeing 747-100s of BOAC. KEY COLLECTION

The first customer for the new aircraft was Aurigny, the airline set up in 1968 to ensure a regular Guernsey-Alderney flight when British United Airways withdrew from the route. Aurigny initially operated Islanders, but, having carried more than 45,000 passengers in the first year of what was essentially an aerial bus service, its Islanders had effectively created the demand for a larger aircraft. It seized the chance to add a similar machine with greater capacity to its fleet.

Aurigny's interest was illustrated by the second prototype and demonstrator, G-AYTU, appearing in Aurigny colours when it embarked on its programme of test and demonstration flights, though it was destined never to fly with the carrier. In a moment of pleasing symmetry, the first Aurigny Trislander, G-AYWI, was photographed at Heathrow alongside BOAC's equally new Boeing 747s on the award of its certificate of airworthiness on 21 May 1971. The airline ran the first commercial Trislander flight on 1 October 1971.

The Trislander's ability to use short runways meant it was one of the only machines of its capacity that could operate from Alderney Airport and its 2,887ft main concrete runway (and two shorter grass strips) — Jersey and Guernsey had both seen their runways extended to more than 5,000ft since the end of World War Two. Moreover, the piston engines of the Trislander made it eminently suitable for the short sectors between the islands themselves, Alderney to Guernsey taking 12-14 minutes. Turboprops were not economical to operate, being 'lifed' according to engine cycles rather than time running. Nor, in the 1970s and 1980s, were they as reliable as today when operating with a high number of start-stop cycles. The Trislander's combination of capacity, short-field performance and the practicality of its powerplants made it the most suitable aircraft for the Channel Islands service.

It also won the hearts of the islands' people. In 1981, Mick McCormick of Alderney wrote some children's stories based on an Aurigny Trislander called Joey. Embracing the idea thoroughly, the airline published the *Little Yellow Plane Adventures*, and re-registered one of its Trislanders

One of the few surviving airworthy Trislanders is freight-configured N920GD of Flamenco Cargo, here on approach to San Juan in January 2023. RICHARD VANDERVORD

Rockhopper's G-BEDP landing at Bournemouth in December 2005. It served the Channel Islands with the type from 2001-11. VIA MATTHEW WILLIS

A different variation on Aurigny's titles, launched by the Guernsey-based carrier in April 1996, is sported by G-BDWV. KEY COLLECTION

as G-JOEY. For Comic Relief in 1988 the aircraft was given a red nose, and the engineers decided to paint a face on it shortly afterwards.

All but one of the carriers that operated a service to Alderney after the return of competition in 1979 used Trislanders. These included Air Camelot, which flew from Bournemouth to Alderney in 1985-86, and Air Sarnia, which ran a route from Southampton to Alderney in 1989-90, and planned to add Birmingham and Bembridge. The competition with the States-owned Aurigny led to some friction with the islands' authorities. It culminated in the bizarre situation where one of Air Sarnia's two Trislanders, G-SARN, was arrested (as opposed to impounded) by the Guernsey police for alleged non-payment of fees.

A further Trislander operator — longer-lived than the others — was Le Cocq's Air Link, which started services from Bournemouth in 2001, specialising in carrying perishable foodstuffs. The airline became Rockhopper in 2003 and then Blue Islands in 2006, expanding its operations in the mid-2000s, acquiring several more second-hand and refurbished Trislanders. These included G-RHOP (originally G-BEFP, built in 1976) during 2004 and G-BEDP the following year.

In November 2011, however, Blue Islands was declined a new licence for its Southampton-Alderney service, and announced it was selling its two remaining Trislanders. They were replaced for the Jersey-Guernsey run by ATR-42/72 and Jetstream 31 turboprops.

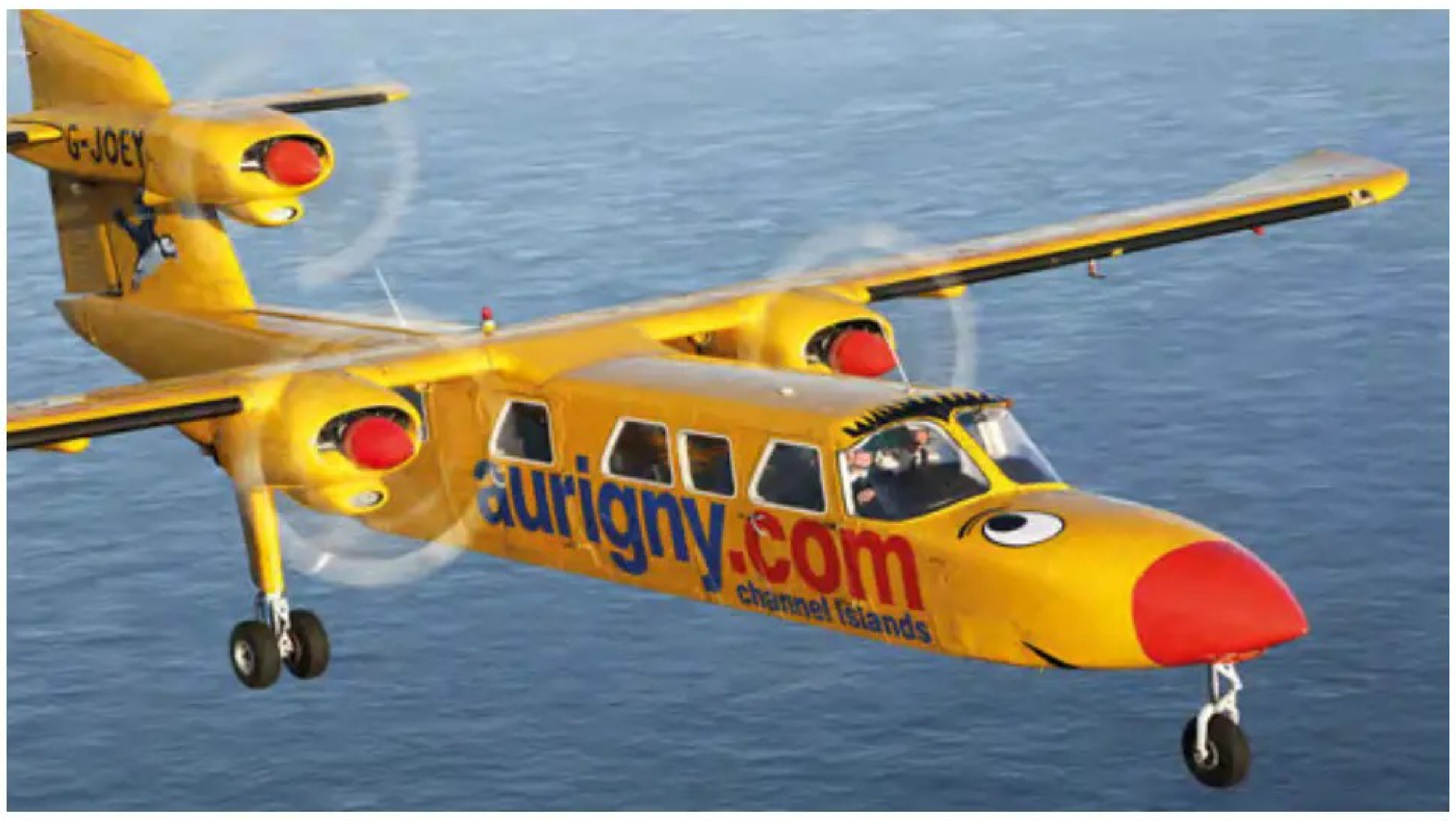
Meanwhile, the States of Guernsey bought into Aurigny in 2000, in response to British Airways halting some flights, and the airline became wholly owned by the States in 2003. At the height of Aurigny's Trislander operations, it owned 12 of the type. The small size of the aircraft even by regional airliner standards made it economical for the airline to maintain 'spare' aeroplanes, and to add additional flights if demand increased — a flexibility few carriers could boast. This enabled load factors in excess of 70 per cent. The seasonal nature of flights to the Channel Islands, with a big increase in the summer months, meant part of the fleet would inevitably be under-used during the off-season, and with the small, cheap nature of the Trislander it was less problematic to stand aircraft down, the advantage being that this time could be used for maintenance.

Furthermore, the importance of the Trislanders for carrying freight meant that during under-filled flights, Aurigny could take advantage of the aircraft's easily removable seats to accommodate additional payload in the cabin. There was a regular newspaper run, and freshly baked bread was carried from Cherbourg. The inaugural mail flight between Guernsey and Alderney took place on 18 June 1976, with G-BCNO. Performance tests at increased load were carried out on an Aurigny Trislander in 1996, and the airline was consequently permitted by the CAA to increase the maximum take-off weight by 500lb. While Aurigny initially operated Islanders and Trislanders together, eventually the twins were supplanted entirely by the trimotors.

Despite several attempts, the type proved hard to replace. An experiment in the early 1980s with DHC Twin Otters "was not a happy experience for us", according to Aurigny's managing director Craig Alexander, who added, "some of our passengers said it wasn't as comfortable in bad weather. The Trislander is a very robust aircraft, and didn't seem to react quite so violently in very windy conditions."

But by the 2010s, the airframes were ageing and passengers less inclined to put up with the noise and spartan interior. The relatively low performance of the Trislander meant it had less chance of fitting into gaps between patches of bad weather than faster aircraft such as the Dornier 228. Although the area covered by the Channel Islands was relatively small, it was not unusual to see different conditions in each of three main islands.

The Trislander typically took around 15 minutes to load, the need for the pilot to check the multiple doors were safely closed adding a few more minutes, and 40-50 minutes to fly between Southampton and Alderney. A turboprop could cut 10-20 minutes off the flight time, allowing more opportunities to exploit narrow windows of clear weather. Rather than risk a diversion to mainland France or England during an inter-island flight, leaving passengers and aircraft in the wrong country, Aurigny preferred to cancel services. With the Dornier 228 chosen as a successor, the airline's final Trislander was retired in May 2017, G-BEVT being delivered the following month to the Duxford Aviation Society's British Airliner Collection for preservation.



Trislander G-JOEY became the most famous of Aurigny's aircraft thanks to a series of children's books. It was retired in 2015 and is preserved at a play barn at Guernsey's Oatlands Village. JEAN-MARIE URLACHER VIA AURIGNY

Scottish islands

Serving the Scottish islands, Loganair was an early adopter of the Islander and, like Aurigny, would quickly see the benefit in its larger sibling. In June 1973, Loganair became the second UK airline to operate the type, with G-BAXD flying from Glasgow, before moving to Sumburgh on Shetland in September for oil-rig support. That December another Trislander was acquired and began flying the Glasgow-Dundee-Skye route in April 1974.

Loganair took on the routes from Glasgow to Barra and Tiree in September 1974, and the Trislanders were used for those too. Barra had no runway and flights operated from the beach, so naturally timetables were subject to the tides. The Trislander proved just as able to fly from a beach as the lighter Islander, and its extra capacity was useful for carrying essential supplies such as food and newspapers. Loganair added further services in 1975, including daily Benbecula-Stornoway and Inverness-Edinburgh links, while Trislanders were employed on charter flights for the oil industry. In the mid-1970s, Loganair was the type's largest operator in the world, with a fleet of eight. This was the heyday of Loganair's Trislanders, as they were phased out from the end of the decade, finally being retired in favour of Twin Otters during 1982.

A windswept Barra is the setting for Loganair's G-BDTP. ALAMY

The beach operation at Barra helped elsewhere, as it indicated further options for emergency landings. On 8 June 1998, just after take-off for a morning flight from Jersey to Guernsey, the port engine of Aurigny's G-BEVT failed. The pilot carried out the procedures for an engine failure, but found the aircraft was unable to climb. La Pulente was ahead, with its 4km beach, so the pilot elected to land there — an eventuality covered by Aurigny's training. The surface was wide, firm and smooth, and the Trislander landed with no difficulty or damage, or injury to passengers or pilot.

Going global

The Trislander proved popular in the same parts of the world where the Islander had found an eager customer base, though sales were never on the same level. The third Trislander, G-AYZR, was sold to Cavico of Florida and was entered in the Great London-Victoria British Columbia Air Race in July 1971, flown by The Hon Hugh Waldorf Astor, Sir William Dugdale and Capt Joe Blyth. After negotiating fog, ice and strong headwinds on the 6,000-mile flight, it ended up 22nd of 54 finishers, and 15th in its class. Shortly afterwards, G-AYZR was registered N85CA and based at Fort Lauderdale.

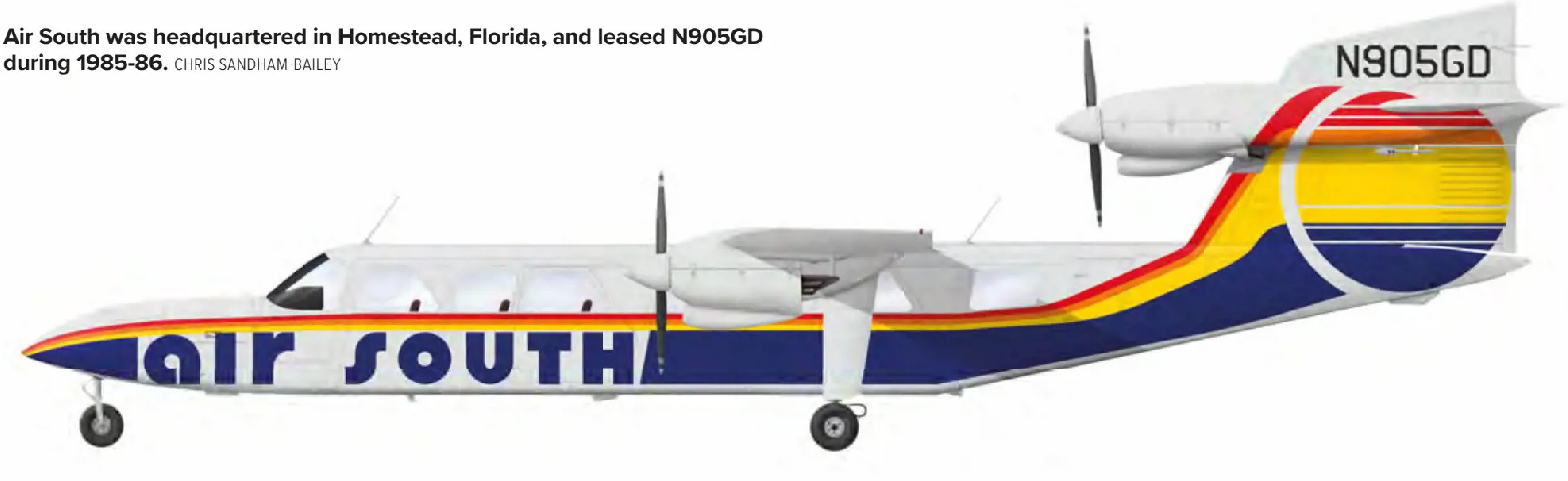
The next aircraft also went to the US, long-standing Islander distributors and operators Jonas Aircraft of New York acquiring c/n 299 as N60JA in November 1971. Thereafter, in the next few years Trislanders were sold to CMC Aviation in Nairobi, IAS in New South Wales, Air Melanesia in the New Hebrides and Barringer Surveys in Johannesburg.

A remarkable feature of the Trislander's career is the number of new operators it found even decades after it went out of series production. Examples include InterIsland Airways in the Aegean, which first employed Trislanders in 1999, and Golden Arrow Airways, which began using them in Guyana during 2014. The latter operated daily scheduled flights from Ogle International Airport to Kaieteur, where passengers would disembark for a two-hour tour of the Kaieteur Falls, before admiring the waterfall again from the air. The Trislander was particularly suitable, being the only type that could accommodate 17 passengers and operate from the short Kaieteur runway. Indeed, the runway was, at 2,018ft, a little tight for a fully loaded Trislander and at times virtually every foot was needed. In September 2014 a Trislander landed a little short of the strip, damaging the aircraft, though all passengers and crew were unharmed.

After Golden Arrow closed, another Guyana airline, Roraima Airways, acquired the two Trislanders. Roraima unveiled the aircraft in April 2016, lead pilot 'Gerry' Gouveia expressing an aspiration for the airline to run five of them. He noted admiringly how the introduction of the Trislander onto the Kaieteur service had reduced the price of a tour from US$200 to $145.

One of the two former Golden Arrow aircraft was retained for

Air South was headquartered in Homestead, Florida, and leased N905GD during 1985-86. CHRIS SANDHAM-BAILEY



Trans-Jamaican Airlines of Montego Bay was the recipient of 6Y-JJI. KEY COLLECTION

spares, while four more were bought from Great Barrier in New Zealand. Several were completely rebuilt by the Roraima engineering team and afterwards described as "a dream to fly" by the airline's director of operations, Learie Constantine Barclay. Barclay added that the typical nature of runways in Guyana is "hardly paved and typically only 2,000 feet long", which "makes for different and interesting flying to which the Trislanders have really adapted very well."

Thanks to their long airframe life, many Trislanders have outlived several airlines, and made epic journeys when moving from one operator to another. The last built, c/n 1055, started out by becoming one of only two Trislanders in military service when it joined the air arm of the Botswana Defence Force in 1984. Thereafter it went to a civilian operator in Botswana, then to Zimbabwe, ending up in Greece in the 2000s. Durig 2008 it was purchased by Unity Airlines in Vanuatu as YJ-OO19, and undertook a mammoth flight via Luxor, Bahrain, Muscat, Ahmedabad, Calcutta, Kuala Lumpur, Bali, Darwin, Mount Isa and Gladstone before arriving at Port Vila. The following year, YJ-LGF completed a similar trip.

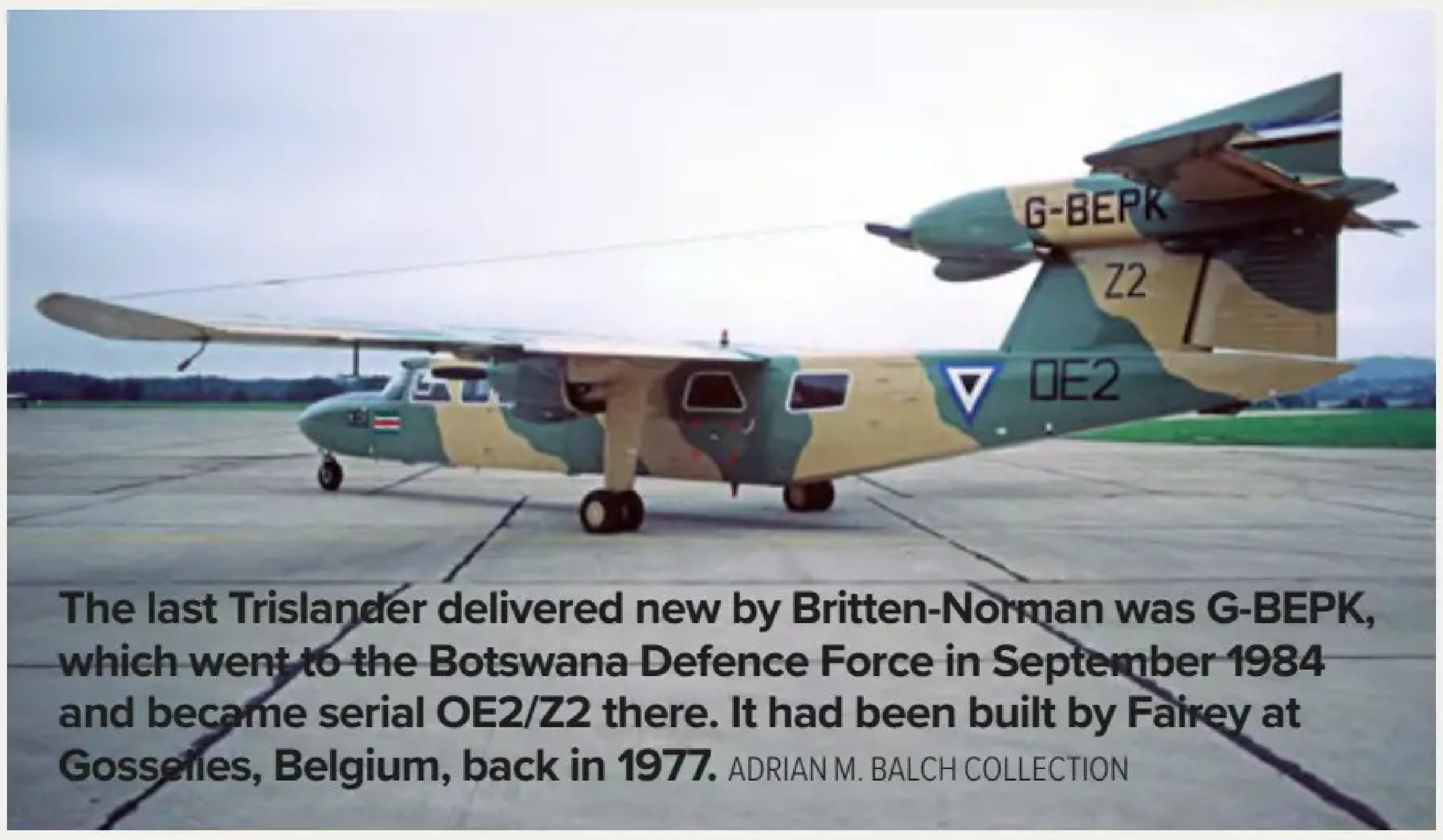
When Unity disposed of YJ-OO19 in 2019, after which it had accumulated 7,079.5 hours and 10,000 cycles of operation, it was acquired by Anguilla Air Services and made another long flight from the South Pacific to the Caribbean. Remarkably, YJ-LGF followed suit the same year, having initially been sold to New Zealand, this machine being one of those bought by Roraima.

Even in locations where the Trislander had once been particularly popular, the type saw a drawing-down by the late 2010s. As of early 2025, it was reported that only six Trislanders were still in operation worldwide: three in Guyana, one in Anguilla, and two in Puerto Rico.

Passengers wait to be picked up from Bird Island by S7-AAG of Air Seychelles during 1980. ALAMY

DATAFILE

ALTERNATIVE ROLES



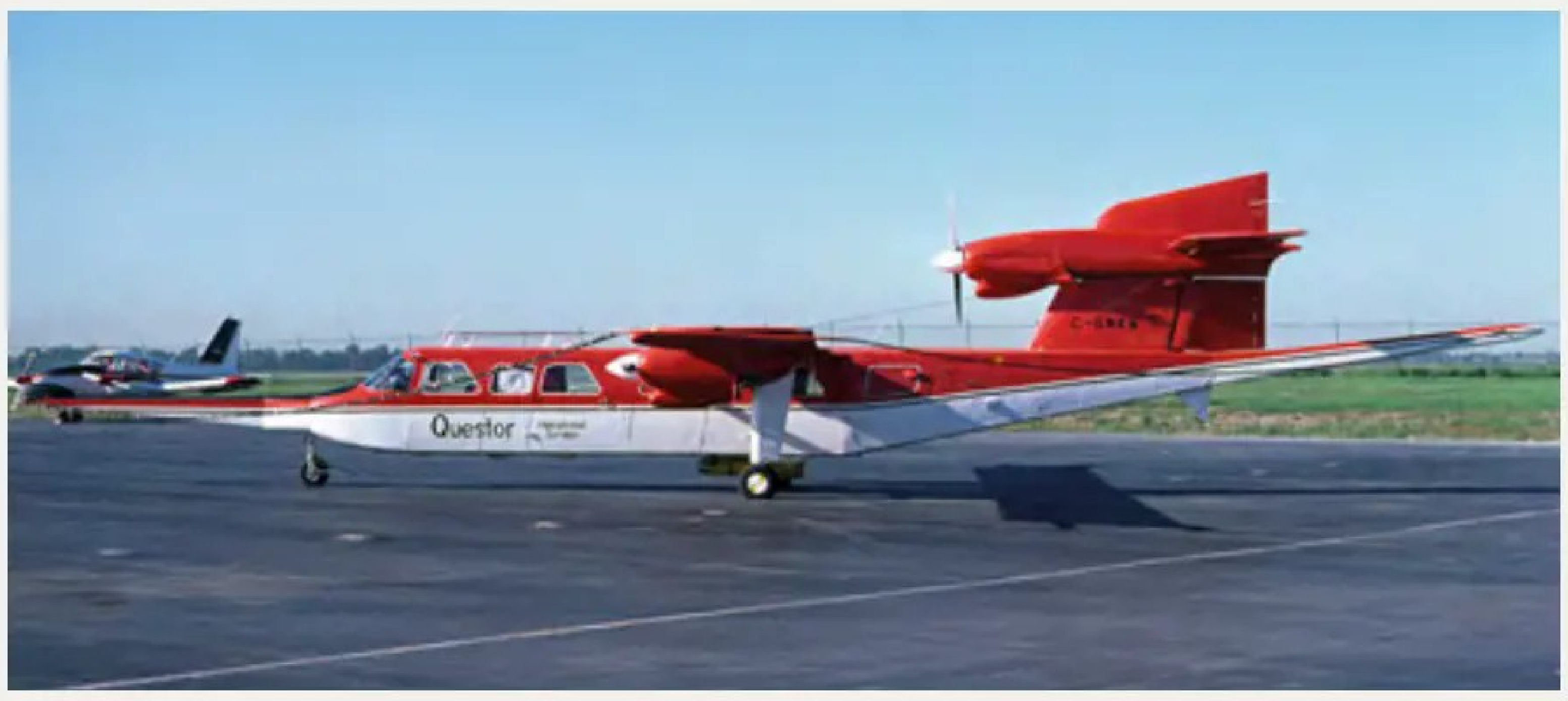
The last Trislander delivered new by Britten-Norman was G-BEPK, which went to the Botswana Defence Force in September 1984 and became serial OE2/Z2 there. It had been built by Fairey at Gosselies, Belgium, back in 1977. ADRIAN M. BALCH COLLECTION

The Trislander never occupied the same wide array of roles as the Islander, but it was nevertheless employed in non-passenger activity by several operators. While B-N offered a military adaptation in a similar fashion to the Defender, only two Trislanders were ever sold to a military air arm, that of Botswana, where they served in the transport and communications role from 1984-91.

A small number of Trislanders were adapted for survey tasks. A long-term operator was Questor Surveys in Canada, which had C-GNKW, C-GOXZ and C-GSZI modified with magnetometer booms for geological survey work. The first arrived in 1974. Initially they were fitted with a boom extending from the tail, while in the late 1980s they gained a long nose boom. C-GSZI was lost in an accident during 1981, while the others were sold in 1990 and 2002.

Trislanders also functioned as air ambulances, though usually alongside their passenger role. The aeroplane proved uniquely suited to flying medical emergencies from Alderney to Guernsey, in cases where the smaller island's hospital was not equipped to treat a patient, and was arguably more suitable for this purpose than the aircraft that replaced it. Aurigny used the type for ambulance work right up to the retirement of its last airframes, and indeed one of the planned 'farewell' flights for enthusiasts which were staged during 2017 had to be rescheduled because the aircraft was needed to carry out an emergency transfer.

As with the Islander, the Trislander could easily be converted to freight operation, as the seats were simple to remove and the attachment points also doubled as freight tie-downs.



There was no mistaking the Questor Surveys Trislanders such as C-GNKW when they had both nose and tail magnetometer booms attached. ADRIAN M. BALCH COLLECTION

As pilot or passenger, the Trislander's qualities came to the fore — and its foibles, too

A pretty full passenger load being carried out of Jersey by Aurigny's G-FTSE, as it heads to Guernsey on a mid-afternoon hop in September 2008. BEN DUNNELL

aurigny.com
channel islands

The Trislander's dependability and maintainability, its ease of loading and unloading, its high capacity for its size, and its reliable piston engines made it uniquely suited to flights both from mainland to islands, and to links between islands. The relatively high passenger numbers and need for a 'commuter' service set against the extremely short sectors on inter-island flights made for a unique challenge, for which the Trislander proved the most suitable available aircraft for almost five decades.

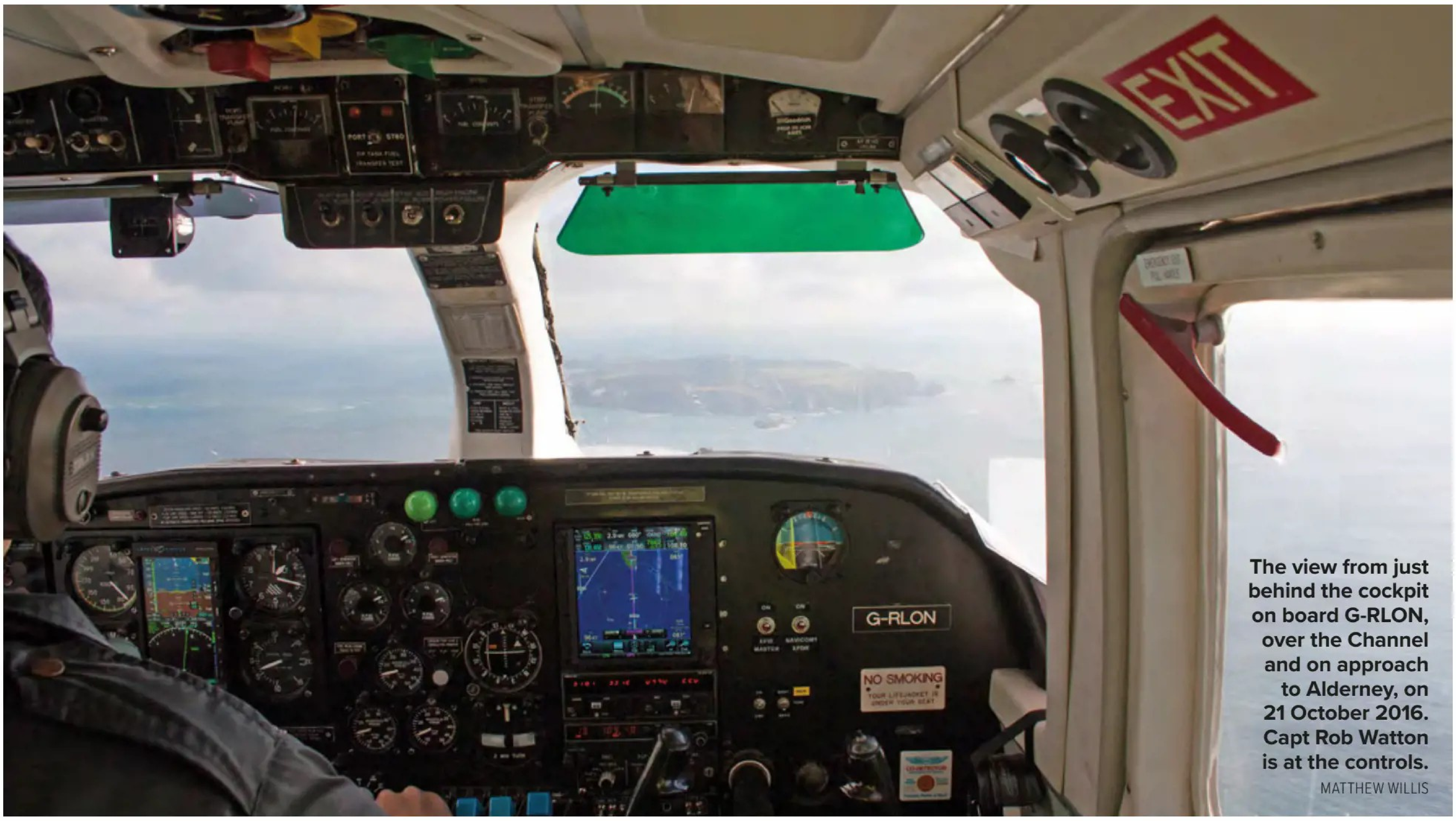
Capt Warwick Bayman, speaking in 2015 when the Trislander was scheduled for replacement, described operating the machine with Aurigny: "The Trislander was built very agriculturally, using simple constructional techniques, and this means that when something broke it could be replaced easily including the airframe, as it inevitably corroded. Instead of wearing out it became a 'Grandma's broom', so how much has remained original is hard to say.

"The Trislander is relatively slow, quite noisy and relatively heavy on the controls. It is quite spritely when empty, with a power nearly that of the early Spitfires, but once loaded it's heavy and sluggish. In taxi, the rudder pedals are very stiff, probably due to old nosewheel cables, so most of the time I use brake and asymmetric power to steer.

"The aircraft has always had its critics and although it was fine for the job in its early days, it isn't really acceptable now, as higher standards are expected in modern times. This, added to the problem of getting spare parts, has made the future nearly untenable so we have an aircraft that isn't going into the future. Unfortunately quite a large number of locals can't see life without the Trislander. What they don't realise is the option is change to another type or have no flights.

"With such short sectors a petrol-engined aircraft made so much more sense than a turbine lifed by start-stop cycles, but as time has progressed the maintenance costs have risen on the Trislander, closing the gap in operating costs against turbines. My personal belief is that the Trislander is possibly still the cheaper option, but it's going to grind to a halt in the nearer future. The options for replacement are all more

Travelling aboard a Trislander in its element, on an inter-island service — in this case, Alderney being the destination. MATTHEW WILLIS



The view from just behind the cockpit on board G-RLON, over the Channel and on approach to Alderney, on 21 October 2016. Capt Rob Watton is at the controls. MATTHEW WILLIS

capable aircraft although possibly more expensive. More importantly they don't have some of the performance constraints the Trislander also has, which aren't really acceptable in modern times.

"The Trislander has allowed multi flights on short sectors, allowing increases and decreases in seats to match demand changes, and being agricultural with nearly all parts exchangeable as they wore or corroded meant the aircraft would keep going as long as the hours of maintenance on fabricated parts such as skins, etc, took place, plus the parts that needed buying in were available. As the traffic on the routes has shrunk over the years we have managed to cannibalise aircraft to keep the fleet going with three flying plus the famous 'Joey' — but we are really at the end of the line, and if we cannibalise now, we won't have an aircraft left to fly.

"We have a payload capacity of 1,200-1,300lb depending on fuel carried. Most of the freight is boxed and loaded by the ground staff, and we carry everything we can safely carry from the new-born (in fact including the mother in labour) to coffins, the kitchen sink to the oven, parrots, goats, you name it... When the bigger aircraft break we collect spares, some quite large — if it fits through the door and isn't dangerous goods we carry it. If they break, you can bet it's in Southampton or Dinard, requiring rescue flights with parts and engineers. It's been a mission for ten years, and with the Islander elsewhere before that.

"To sum it up — basic, rugged, reliable, although less so in old age. Although it's less and less suitable in modern times it still gets the job done, but the sun is setting."

> *"A lot of locals can't see life without it"*

The author flew on G-RLON on the morning of 21 October 2016, from Southampton to Alderney, seated behind the pilot with an excellent view of the cockpit and ahead. When the throttles opened up, the Trislander surged forward and rapidly gained speed. It rotated at around 75kt and climbed smoothly away with no sense of a struggle with gravity. The other feature that became obvious when the throttles were opened was the cabin noise level. The third engine meant that for those passengers seated in the back of the cabin, the noise was even greater, although the difference was relatively slight. Even when the engines were throttled back as the Trislander reached its cruising altitude, between 4,000 and 5,000ft, the noise did not abate particularly; it just changed in tone.

With that altitude having been reached, the aircraft cruised at around 150kt. Being so much lower than most airliners fly, the view of the world below was superb. Once over the English Channel in the morning, 15 minutes after take-off, the cloud began to break up and ferries and cargo ships were clearly visible. A peculiarity of the Trislander was a tendency of the aircraft to 'nod' as it flew straight and level on autopilot, the trim wheel gently rolling back and forth to maintain the required altitude and slightly overcompensating.

That aside, it was a smooth trip. Around 50 minutes in, the tiny bird-sanctuary island of Burhou appeared, our first sight of the Channel Islands, before the patchy cloud parted revealing Alderney behind it. Approaching Alderney, the grey slash of runway was visible amid the grassy expanse while the aircraft was still well over the sea. The rugged sea stacks and cliffs grew in the large windows before the Trislander skimmed over the coastline, already well onto its final approach, and touched down gently just under three quarters of an hour after the wheels left the runway at Southampton.

In four more minutes, people were already disembarking and luggage was being unloaded from the nose and tail. Around two minutes after that the process was complete, all passengers heading to the terminal building and the aircraft being readied for the flight on to Guernsey, which made the hop from Southampton look like a long-haul.

Thanks to Chris Wyman, Warwick Bayman and Aurigny Air Services.

Events

The Fighter Collection's P-36C and P-40F catch some evening rays. It was the first time either had flown at Old Warden. BEN DUNNELL

Shuttleworth Military Air Show

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MAY

Saturday 31 May 2025 could well go down in the annals as one of the most important days in the history of the Shuttleworth Collection, the Military Air Show having been chosen as the first display to take up the new, regular Saturday slot. The decision to change days comes following collation of evidence suggesting a clientele untethered from the increasing pressures of weekday life and the dreaded Sunday evening blues now find Saturday a more comfortable option.

A second innovation saw the show take place in two parts. The afternoon display finished at the usual six o'clock-ish, then resumed at seven-thirty, the raison d'être being two-fold: calmer pre-dusk winds are likely to provide more opportunities for the Edwardian aeroplanes to get airborne, and the 'magic hour' light should bring out the best in other, heavier-metal acts, with these limited slots predominantly given over to visiting aircraft.

Well, evidence from this first show under the new formula points to a comprehensive

G-ABVE
G-ABVE
48

Ben Cox put on a tremendously zestful solo in the Arrow Active II — and joined up with DH60 G-EBLV — to pay tribute to Desmond Penrose. BEN DUNNELL

SE5a and Spitfire Vc providing one of the sights of the season, a great piece of flying by Si Davies and Paul Shakespeare. BEN DUNNELL

vindication. Any concerns that habits die hard and numbers would be down were shattered by one of the largest crowds for many years, and worries that people would drift away between six and seven-thirty were quashed, with the vast majority of visitors staying until the last aero engine had been shut down.

A fresh crosswind during the main show saw expectations of any Edwardian action — even with the prospect of an evening session — seemingly extinguished, but, for the first time since July 2024, an 'Ed' was able to get into the air for the public, in the shape of the *Magnificent Men* Roe Triplane, with 'Dodge' Bailey at the vestigial controls. Much of the afternoon event had been flown in less-than-sparkling conditions, Jon Gowdy in particular having to tolerate leaden skies during his exquisite display in the IWM's Spitfire Ia N3200, but the clouds parted for the evening segment allowing The Fighter Collection's Curtiss duo — Brian Smith in the P-40F and Stu Goldspink in the P-36C — to cavort exuberantly in late-evening luminosity.

The show had opened with Sqn Ldr Mark Sugden in the world's oldest airworthy Spitfire, the Britain of Britain Memorial Flight's MkIIa, P7350. Another early highlight was a tribute to test and display pilot Desmond Penrose, who died on 13 May at the age of 95. Arrow Active II G-ABVE, formerly owned and demonstrated by Desmond and in the hands here of Ben Cox, was accompanied by Shuttleworth's DH60 Moth G-EBLV, also flown by Desmond in many Old Warden events of yore including the very first in 1964. Here, James Hepnar used it to give *his* first display as a collection pilot.

An early-war formation comprising Shuttleworth's Gladiator, with Peter Kosogorin up, Ben Cox in Fighter Aviation Engineering's Hurricane I P2902 and the aforementioned Spitfire Ia flew together at Old Warden for the first time. The latter two had both been recovered for rebuild from under the sand of the Dunkirk beaches where they had been brought down during May 1940, in the case of P2902, 85 years to the day before this show. Augmenting them in this Battle of France tribute was the Cambridge Flying Group's Tiger Moth G-AOEI, which, as serial N6946, operated in France with No 81 Squadron before the 'Dynamo' evacuation.

The Shuttleworth Spitfire Vc AR501 and SE5a F904 flew together, the Spitfire overtaking the SE5a at crowd centre several times before Paul Shakespeare and Si Davies essayed some opposition runs. It allowed photographers a few brief 'formation' shots, almost certainly the first time two 'combat veteran' fighters from the First and Second World Wars will have been captured in the same piece of sky by modern, roving rangefinders. The hard-working SE5a also flew a spirited tailchase with Oliver Wulff's spectacular, Stow Maries-based Albatros D.Va reproduction, flown by John Gilbert. Biggest 'heavy' to feature was the Commemorative Air Force R4D, part-way through its European tour, with Jeremy Lashbrook in the captain's seat.

The Shuttleworth Lysander spy pick-up routine was this time further enlivened by three of the large number of visiting military vehicles, in the form of a Wehrmacht Volkswagen Kübelwagen, Schwimmwagen and a BMW motorcycle-and-sidecar combination. Their 'Schmeisser'-happy crews were seen off by the French Resistance re-enactors before the Lysander, which had Mark Sharp in command, departed back to an airfield 'somewhere' in southern England.

Tony Harmsworth

To include a Battle of France tribute was extremely welcome, and the Gladiator, Hurricane I and Spitfire Ia trio gave some very fine passes. BEN DUNNELL

Meeting Aérien 'Le Temps des Hélices'

7-8 JUNE

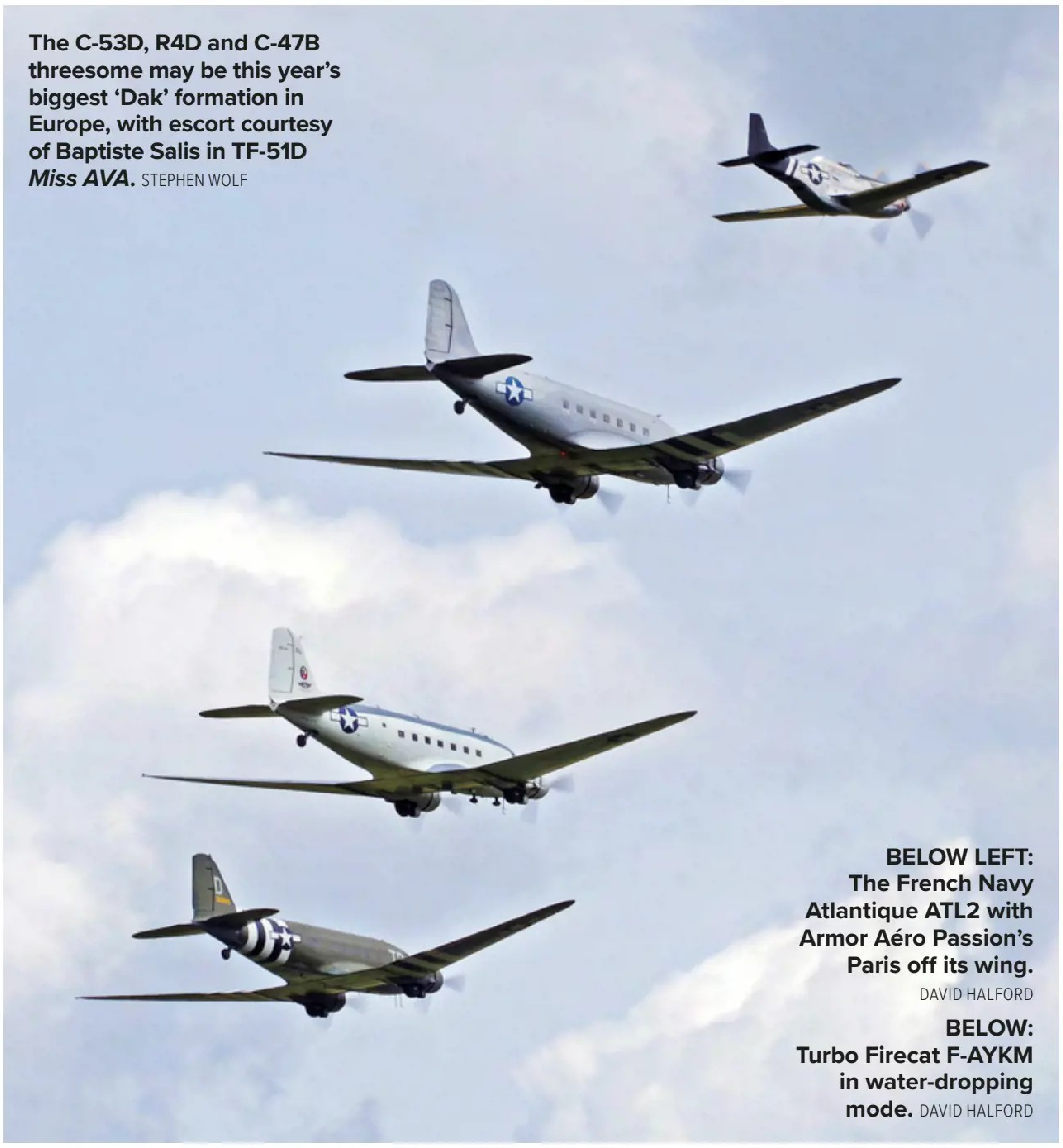
Edmond Salis gets the Casques de Cuir's simply charming Salmson Cri-Cri into the air for its show debut. STEPHEN WOLF

One could only sympathise with those behind the annual Meeting at La Ferté-Alais this year. The likelihood of strong winds blowing across the 'piste' on the Plateau d'Ardenay certainly saw the crowd size well down on the Saturday, with an aggregated figure of only 20,000 spectators over the two days, rather than double that in some previous years. Yet those who chose not to attend missed a fine show, if one that inevitably lacked some of its planned content.

Rather than marking the 80th anniversary of the end of World War Two in Europe, the main theme was the close links the airfield — and its more recent huge film studio/sound stage — has with many movies involving aircraft that have been made in part at La Ferté, or with pilots who are part of the aerodrome's 'brotherhood.' These included such classics as *The Longest Day* and *Empire of the Sun* that stand out among dozens of others, many not necessarily filmed there but which were frequently referenced over the weekend. Routines relating to such as Hitchcock's *North by Northwest*, with six Stearmans, *Mission: Impossible — Rogue Nation*, for which the Armée de l'Air et de l'Espace A400M's display seemed to come ever closer to landing without actually touching down, and others were accompanied by appropriate musical scores.

The Commemorative Air Force's R4D-6S *Ready 4 Duty* added a distinctive presence, arriving straight after its involvement in Normandy's annual D-Day commemorations. Alongside it was the familiar C-47B of Dakota sur la Normandie and the recently restored C-53D F-HVED *Gruesome*, put back into the air by the Musée Aéronautique de Bretagne at Rennes-Saint-Jacques, and in which

Patrice Marchasson put on a spirited show in TFC's Bearcat. DAVID HALFORD



The C-53D, R4D and C-47B threesome may be this year's biggest 'Dak' formation in Europe, with escort courtesy of Baptiste Salis in TF-51D *Miss AVA*. STEPHEN WOLF

BELOW LEFT: The French Navy Atlantique ATL2 with Armor Aéro Passion's Paris off its wing. DAVID HALFORD

BELOW: Turbo Firecat F-AYKM in water-dropping mode. DAVID HALFORD

Beech D17S N61278 is new to the La Ferté-based Aero Vintage Academy fleet, while D18S N2913B was making a comeback after a few years on the ground. Baptiste Salis and Brice Ohayon flew them. STEPHEN WOLF

Hugues Duval was giving pleasure flights pre-show. The W Aircollection's TF-51D Mustang *Miss AVA* just made it for the two show days, having undergone some further work by Air Leasing since its return to flight in 2023. Baptiste Salis managed to negotiate poor weather conditions in eastern England to bring the TF-51 back from Sywell by noon on the Saturday, in time to join the three 'Daks'. His was also a route in part taken by Patrice Marchasson, who had flown The Fighter Collection's Bearcat over on the Wednesday. This and Rich Goodwin's spectacular Jet Pitts aerobatic display were the only British acts for 2025.

One of the unusual elements was the almost total absence of any of the frailer historic aircraft, though the Morane-Saulnier H, Blériot XI-2 Pégoud and Caudron G.III were towed along the runway as a token on Sunday. There was however a significant exception: the first public display of the Casques de Cuir collection's Salmson D7 Cri-Cri Major that has been under restoration for years. Its Saturday debut was cancelled because of crosswinds, but Sunday finally saw it aloft, flown by Edmond Salis. The Cri-Cri's parasol wing recalls the Morane-Saulniers for which La Ferté is renowned, none of which were in the air this time.

It was good to see the Montélimar-based Musée Européen de l'Aviation de Chasse's ex-Sécurité Civile Turbo Firecat back in the air after its refit, having spent four years on the ground. Another turboprop twin, an Atlantique ATL2, was the only Aéronautique Navale contribution, flying with the sole Morane in the show, the MS760 Paris of Armor Aéro Passion from Morlaix. Among the notable absentees were the two regular Rafale displays, those by the Aéronavale and the solo from the Armée de l'Air, the latter of which was allocated to the Cosford show instead, but ended up cancelling due to unserviceability. Missing too was the recently restored Messerschmitt Bf 109 E-4 'Red 12' from Germany. It was due to be flown by Charlie Brown for its airshow debut, but the likelihood of strong winds in France forced the decision to stay at home. Thus there was no chance to compare the moustachioed merits of two well-known historic aircraft pilots, Brown and local fixture Jack Krine, whose choices of facial hair are legendary.

The forecasts also impacted the finances of the event, causing the organisers from the Amicale Jean-Baptiste Salis to issue a warning entitled 'Un Avenir Incertain' ('An Uncertain Future'). It concluded with the core concern: "This sharp fall in attendance, compared with previous 'meetings', could threaten the future of France's oldest air festival". A line from the Marseillaise, "Aux armes, citoyens" seems the only appropriate response!

David Halford

RAF Cosford Air Show

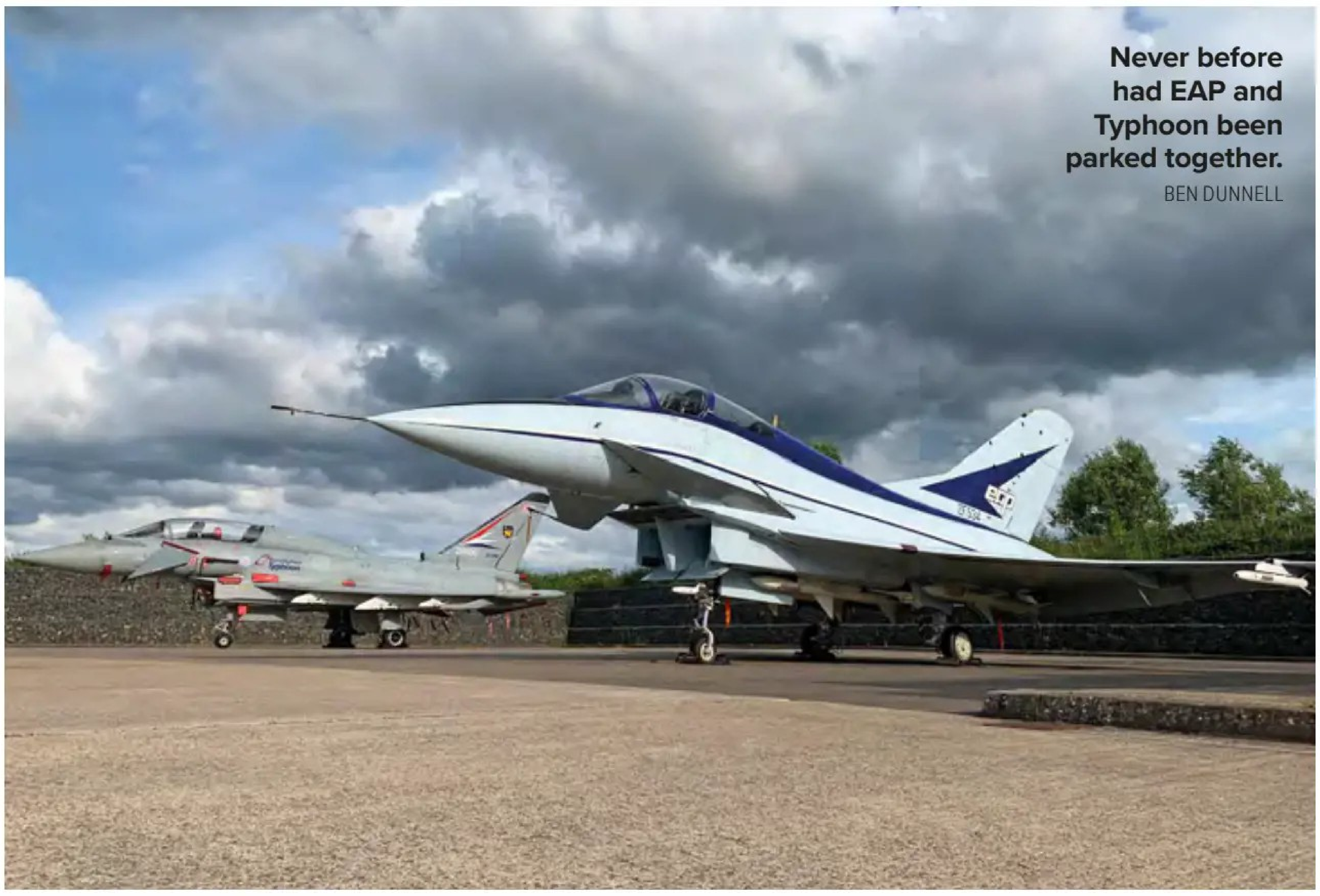
8 JUNE

As the last and only RAF airshow organised on an active RAF air base, a lot is expected of Cosford's event. While the range of current, flyable military types on the ground was limited, the fact of the RAF Museum Midlands and Nos 1 and 2 Schools of Technical Training being co-located on the airfield ensured a large and interesting static park, especially for those who appreciate the Jaguar, upwards of 20 which were to be seen. A special mention should go to a display in the revetment at the western end which brought together EAP ZF534 and Typhoon DA4 ZH590, nicely lined up for photography.

The six-hour flying display had many highlights. The BBMF, after its curtailed 2024 season, appeared twice on the programme, the first time with the 'classic' Spitfire IIa, Hurricane and Lancaster formation and later with two Spitfires, underlining that all-important message 'Lest we forget'. The two-Chipmunk Vintage Pair, each in a different RAF training scheme, featured tight manoeuvring and energy management in a display that took place beneath the depressingly low cloudbase. All credit to pilots Jon Higgins and David Petters on their first aerobatic duo outing. The Royal Netherlands Air Force Historic Flight Spitfire IX, MK732, from Gilze-Rijen gave a short but spirited solo. In the hands of an F-35 pilot referred to only as 'Deuce', this was the aircraft's first time at a UK display since 2013. Its Beech 18 support ship, meanwhile, hadn't been to Britain since the 1988 Great Warbirds show at West Malling, when it was still in the ownership of the Dutch Dakota Association! The Polish Air Force offered its Block 52+ F-16C demonstration, appropriately enough in this Battle of Britain anniversary year. The Red Arrows gave a polished show with nine Hawks, while a second nine-ship national aerobatic routine was flown by the Swiss Air Force PC-7 Team. Both deservedly drew applause.

The senior service put on a splendid formation, Navy Wings' Swordfish W5856 flying with the two Wildcat HMA2 helicopters of the Royal Navy's Black Cats team. With the Swordfish's economical cruising speed of just 104mph, and — just like last year — operating from and to its base at Yeovilton rather than landing at Cosford, pilot Glenn Allison earned his corn. The RAF's Chinook HC6 role demo closed the show, providing a suitable sign-off to the 50,000 capacity crowd. Despite the un-co-operative weather, the organisers staged a cracking event.

Denis J. Calvert


Never before had EAP and Typhoon been parked together. BEN DUNNELL

An exquisite debut aerobatic sequence by the Chipmunks of the Vintage Pair. PAUL JOHNSON

The Dutch Spitfire goes through its paces. BEN DUNNELL

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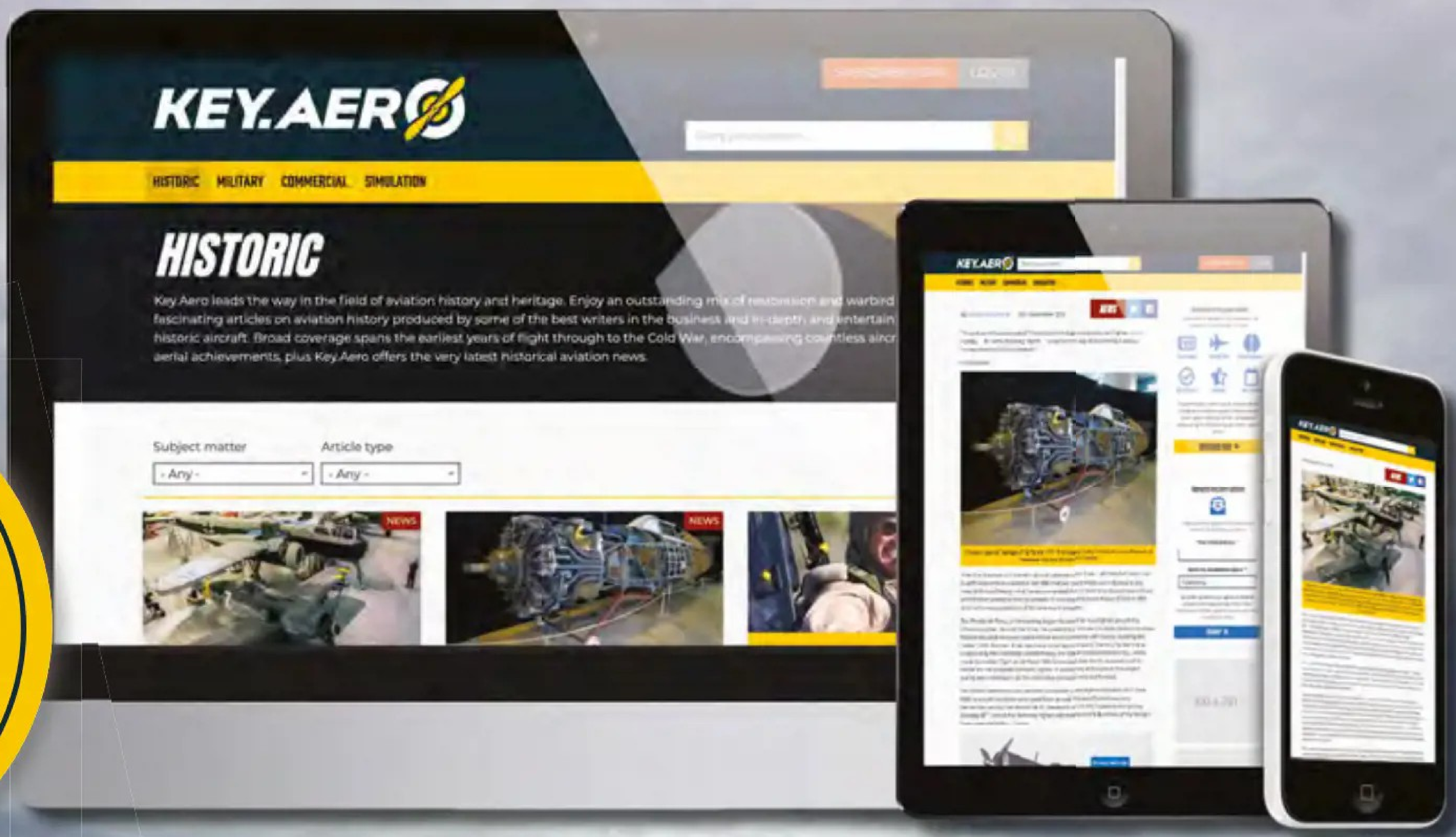

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From scrap bait to GLOBAL ASSET
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The day HMS Javelin ate two torpedoes and asked for more
How Britain's disposable giants became the world's aircraft carriers of choice

VICTORY IN JAPAN 80 YEARS ON
The cover FlyPast August 2025 features the Commemorative Air Force's famous Boeing B-29 Superfortress 'FiFi' – one of only two to remain airworthy. The Superfortress is often remembered for dropping war-ending atomic bombs on Japan, but in this edition we aim to shed light on some of the type's other roles, both during and after World War Two.

AIR-TO-AIR WITH AIRACOBRA
The Military Aviation Museum's Bell P-39 Airacobra is one of only four flying survivors of the type. Uwe Glaser tells this unusual warbird's story.

FORMIDABLE HEROES
In the first of four features this issue, Andrew Thomas documents the last days of the war, exploring the actions of British fighters from HMS Formidable.

POTTERIES SPITFIRE
In the heart of Stoke-on-Trent where old kilns once smoked there now resides a very different type of craft. Jamie Ewan profiles the Stoke Spitfire.

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Pilot July 2025 features electrifying PPL training as its lead feature, which reveals how H55 has built Solar Impulse technology into the Bristell B23 Energic. A leading contender in the race to become the first electric aeroplane to be fully CS-23 certified for flight training, the Energic's power technology is a legacy of the great around-the-world Solar Impulse project.

The issue also features A Better Way to Fly? After years of hiring and owning aeroplanes, including classic 'group A' types, one experienced and active pilot concludes that microlights are the real answer to his and, very likely, your needs.

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655/25

SUMMER READS SPECIAL

Reviews

REVIEWS RATING

★★★★★ Outstanding
★★★★ Excellent
★★★ Good
★★ Flawed
★ Mediocre
✎ Enough said

The latest books for the discerning aviation enthusiast

BOOK of the MONTH

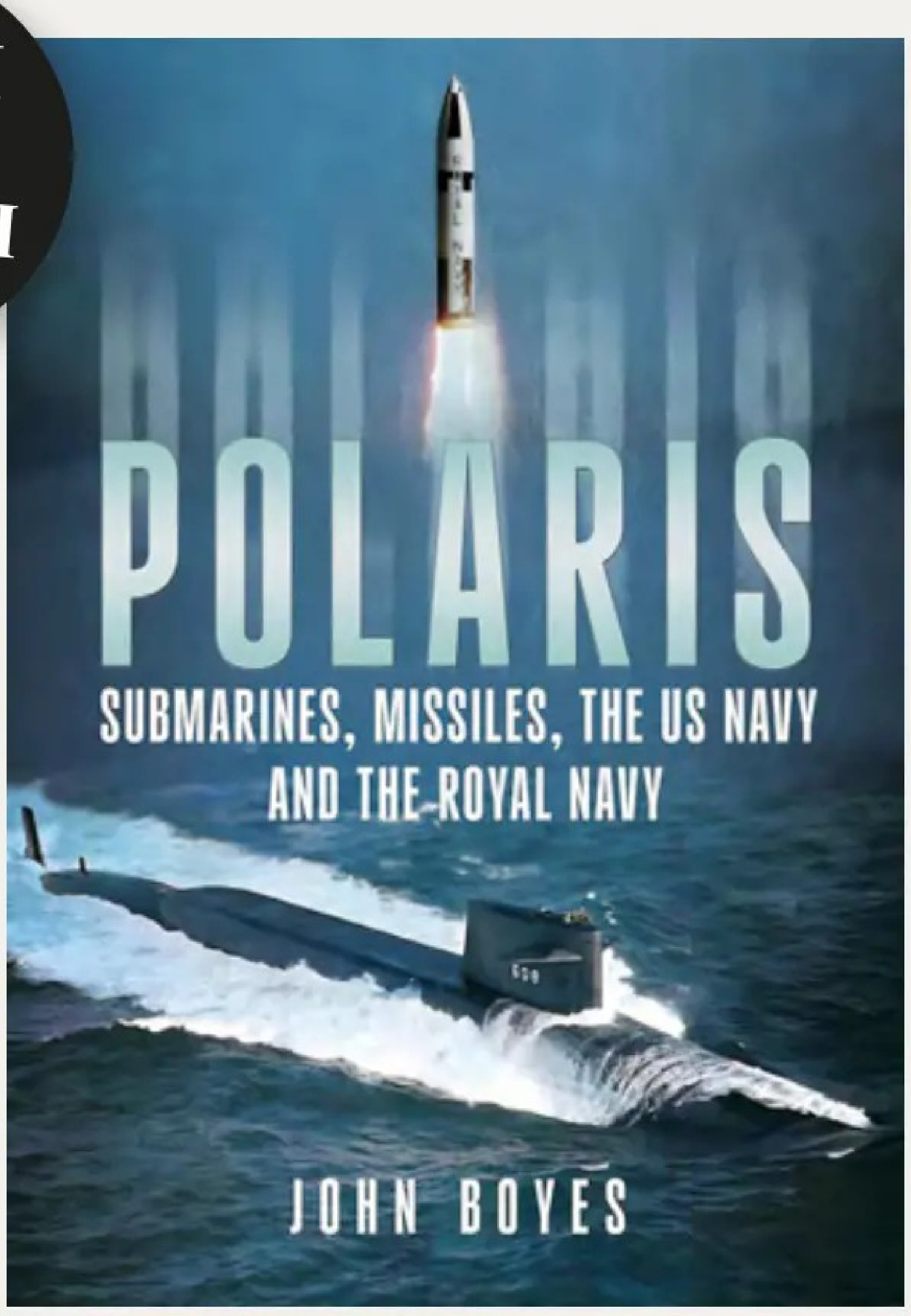
Polaris: Submarines, Missiles, the US Navy and the Royal Navy

by John Boyes
published by Fonthill

This title relates the advent of the nuclear-powered ballistic missile submarine (SSBN) and its emergence as a critically important leg of the US nuclear triad — and the only leg of Great Britain's. It is author Boyes' third book covering a single missile system; his earlier works were on Thor and Blue Streak. Here, he tackles the subject area from every angle, which is where the aviation link comes in.

The story of the UK's adoption of Polaris and the building of its own SSBNs inevitably has its political aspects, and these encompassed the RAF's nuclear deterrent. With the cancellation of Skybolt for the RAF's 'V-Force' in late 1962 and with the grudging realisation that Britain's own Blue Streak was not suited to silo basing, the British government had little choice but to negotiate — albeit not from a position of strength — to buy Polaris from the US. That it got such an agreement, and without the 'dual-key' procedures in place for Thor, must be seen as a considerable achievement. Chapters cover early US missile experiments, US SSBNs and the siting of the Royal Navy's SSBN base at Faslane on Gare Loch. Discussion on the latter point was, Boyes reveals, lively, with the Royal Navy also examining the possibilities of using Falmouth or Milford Haven. There's a full chapter on the UK's Chevaline programme, which provided an improved warhead for Polaris, this a subject not discussed or even mentioned for many years. Here, it is examined in great detail.

This volume is, quite simply, fascinating. I can honestly say I have spent more time with it than with any other title I've had for review in quite some time. Yes, it's technical in parts, but the ins and outs are well explained, with the result that it's all readable by anyone interested in the subject. Most highly recommended.
Denis J. Calvert



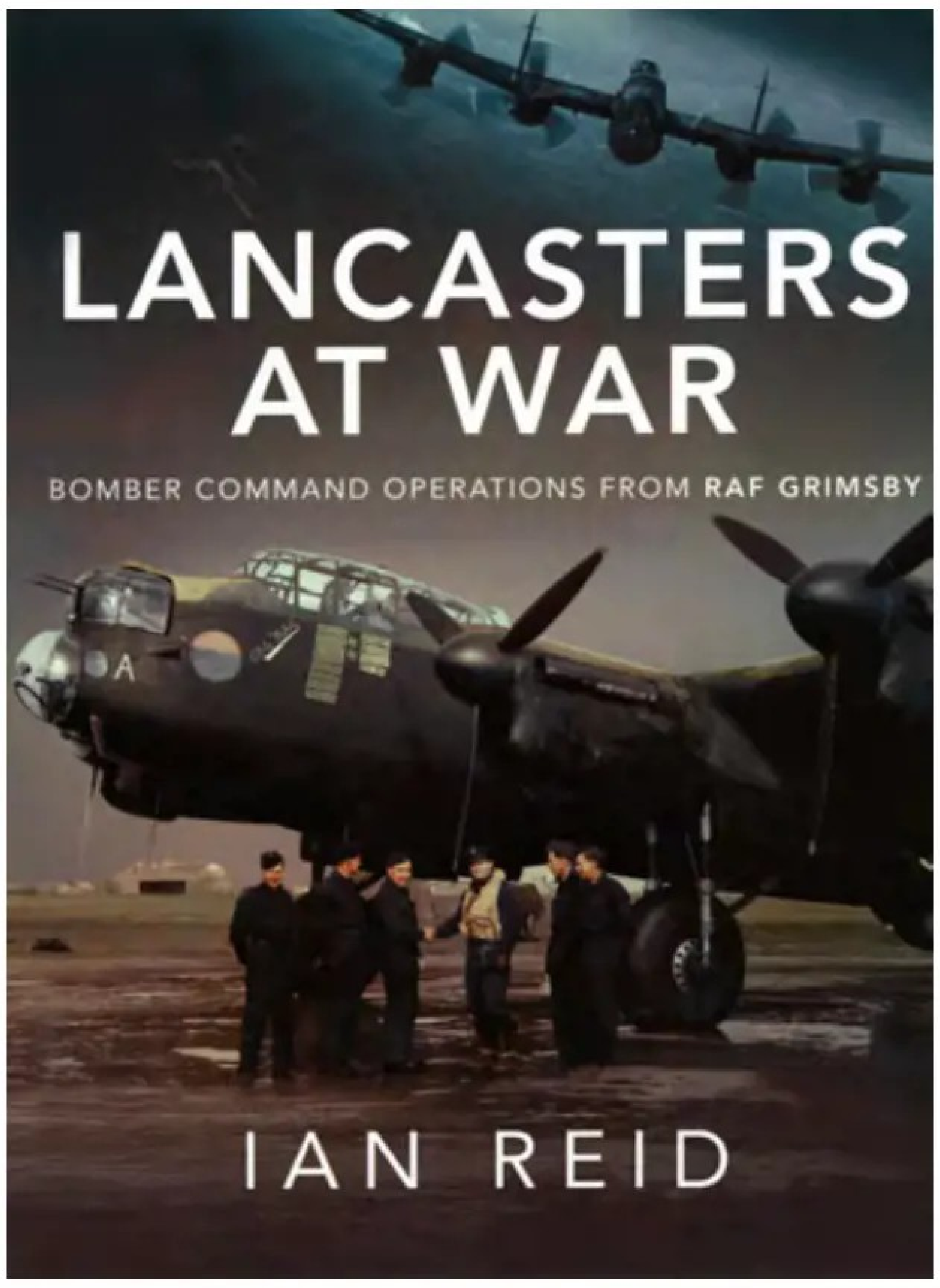
ISBN 978-1-78155-931-4; 9.5 x 6.3in hardback; 366 pages, illustrated; £29.99
★★★★★

Lancasters at War

by Ian Reid
published by Air World

In this weighty tome, author Reid writes on the wartime RAF Grimsby, the activities of the based No 100 Squadron and its part in the overall Bomber Command offensive. His account starts with the re-formation of the squadron with Lancasters in late 1942. Soon after this, the newly appointed squadron leader boss addressed his men; his message was that he was stuck with 10 per cent of scroungers who had been unloaded onto his squadron, and that he was not impressed. Not a promising start!

This is a very human story including plenty of first-person accounts, with off-duty exploits detailed alongside the rigours and risks of operational missions. Twelve chapters and 260 pages relate the squadron's war, while another 200 pages are given over to appendices covering aircraft, operations, losses, personnel and a squadron roll of honour. It all reads well and is clearly the result of many years of research. There are 24 pages of good colour profiles of squadron Lancasters, some with enlarged detail of individual nose markings. Photos are all in black-and-white and many have undoubtedly been gathered from private sources. Sad to relate, photo reproduction can best be described as 'variable.' ***DJC***



ISBN 978-1-52679-261-7; 11.5 x 8.8in hardback; 460 pages, illustrated; £45.00
★★★

The Birth of British Airpower

by Peter Dye
published by Air World

This is a new edition of a title originally published in the US by Naval Institute Press late last year, but which we never saw first time around. Without question it deserves to be brought to a wider audience in Britain, for ex-RAF Museum director general Peter Dye is an authority on First World War aviation, and draws on that here to explore the rise of Hugh Trenchard and the pivotal role he played both as commander of the Royal Flying Corps and in establishing

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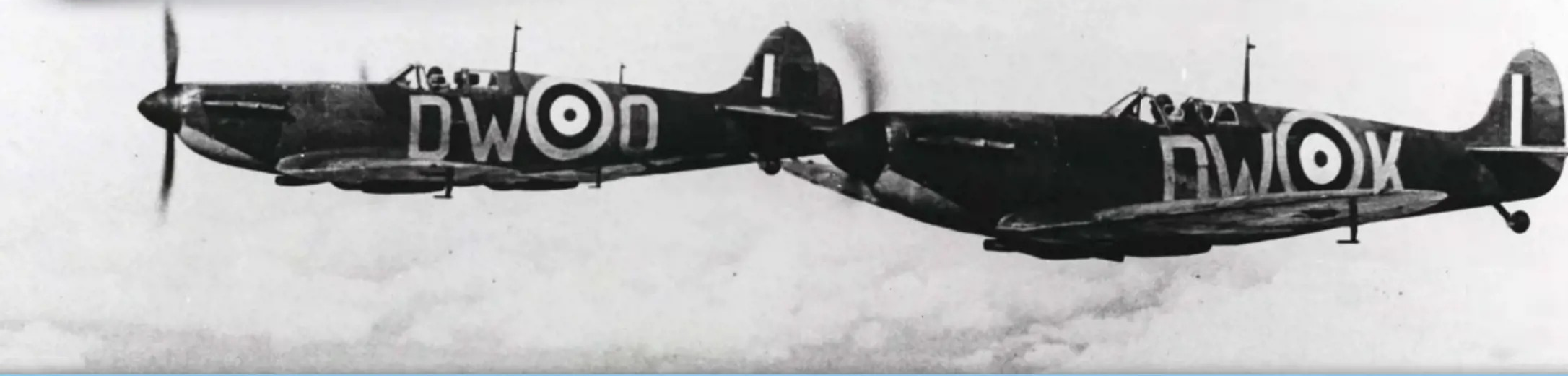

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BOOK of the MONTH

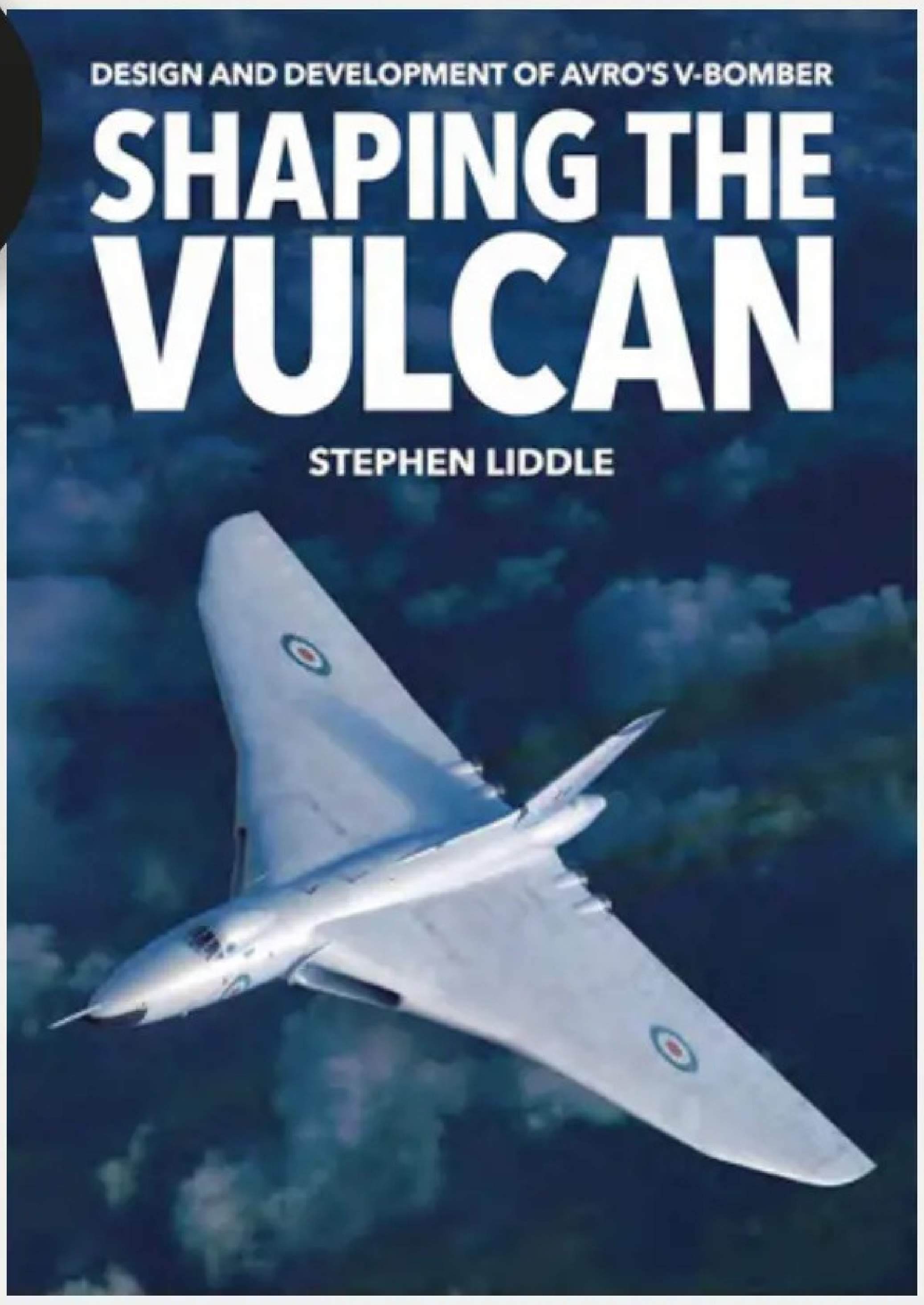
Shaping the Vulcan

by Stephen Liddle
published by Tempest Books

No, you're not seeing things: we have selected two Books of the Month, and deservedly so. The Vulcan might now, for some, rank alongside the likes of the Spitfire and Lancaster in provoking a degree of wonder at how anything new can ever be said about it, but it certainly can. While never ignoring the military requirements which have often been covered in the past, F1 aerodynamicist and Vulcan to the Sky trustee Stephen Liddle fundamentally approaches the Avro delta bomber's story from the design — and, more specifically, the aerodynamic — point of view. How did its radical configuration come about, and how did it end up being perfected?

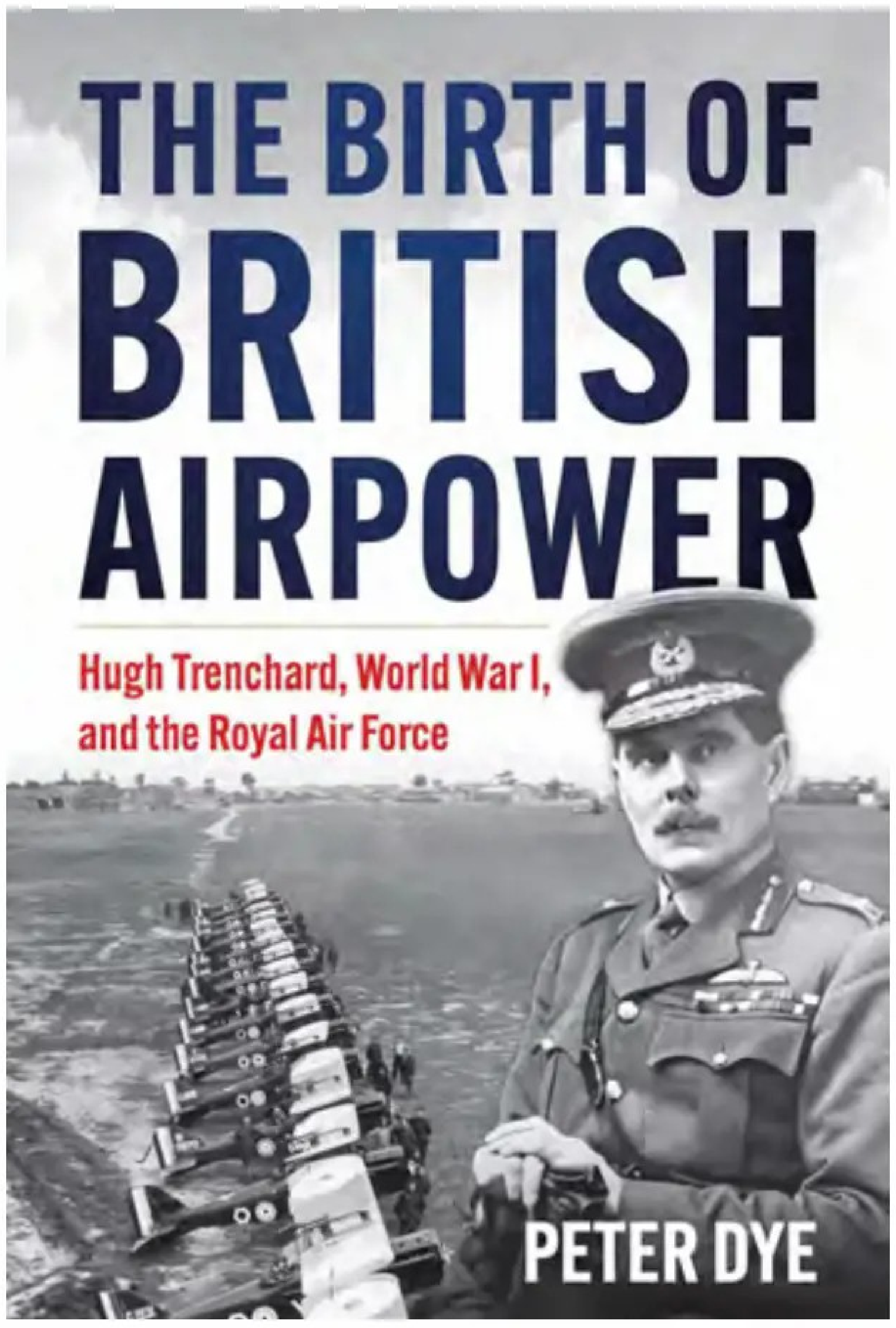
This, and much more, Liddle answers in a style which achieves the always challenging aim of explaining complex technical concepts in a manner understandable to the reader less well-versed in such matters, yet without diminishing the authority which underpins his approach. There has been no better exploration of the way in which the Vulcan's layout evolved, especially with regard to the alterations to its wing leading edge, and how this coalesced with the urgent strategic needs of the Cold War into which it was born. Nor is the Victor forgotten; it gets a chapter of its own to set the Vulcan's aerodynamic gestation into context. Likewise, the Vulcan's weaponry is woven into the story; how it, and the political wrangling that surrounded programmes such as Blue Steel and Skybolt, influenced the aircraft's technicalities.

The book is not only very well-written but also nicely produced, containing a wide range of illustrations including many original diagrams. And if I may be allowed to make one more point in closing: there is a pointed poignancy about Liddle's mention in his preface of how German aerodynamicists were welcomed so soon after the war as "fellow Europeans", which I, at least, appreciated for its humanity. Anyway, buy this, enjoy it and be as impressed as I was. ***Ben Dunnell***



*ISBN 978-1-911704-07-2;
12.0 x 8.5in hardback;
309 pages, illustrated;
£35.00*

★★★★★


THE BIRTH OF BRITISH AIRPOWER
Hugh Trenchard, World War I, and the Royal Air Force
PETER DYE

the RAF. However, the book is far more than merely a biography of Trenchard, as fascinating as that would be. Yes, Dye has produced surely the fullest all-round examination yet of the man as well as his achievements, but the part played by other individuals in the wider story is given suitable prominence. This is especially true of Maj Maurice Baring, a senior member of Trenchard's staff at RFC headquarters, who became a great friend.

The level of Dye's interest and research is given perhaps its best expression in analysing the complex personalities of the dramatis personae. He refers to Trenchard as "someone with behavioural problems and a profound inability to express himself", but also as a man with "exceptional self-awareness", which "allowed him to compensate for his undoubted shortcomings". Baring, by contrast, was a "middle-aged journalist, poet, humorist, and university dropout" with no prior military service. Yet the two gelled, and Dye explores why Baring contributed greatly to Trenchard's achievements. There is also, among much else, the best account this reviewer has read of the circumstances surrounding Trenchard's resignation as the first Chief of the Air Staff just nine days after the RAF came into being. A serious but immensely readable volume, this can only be given very high recommendation. ***BD***

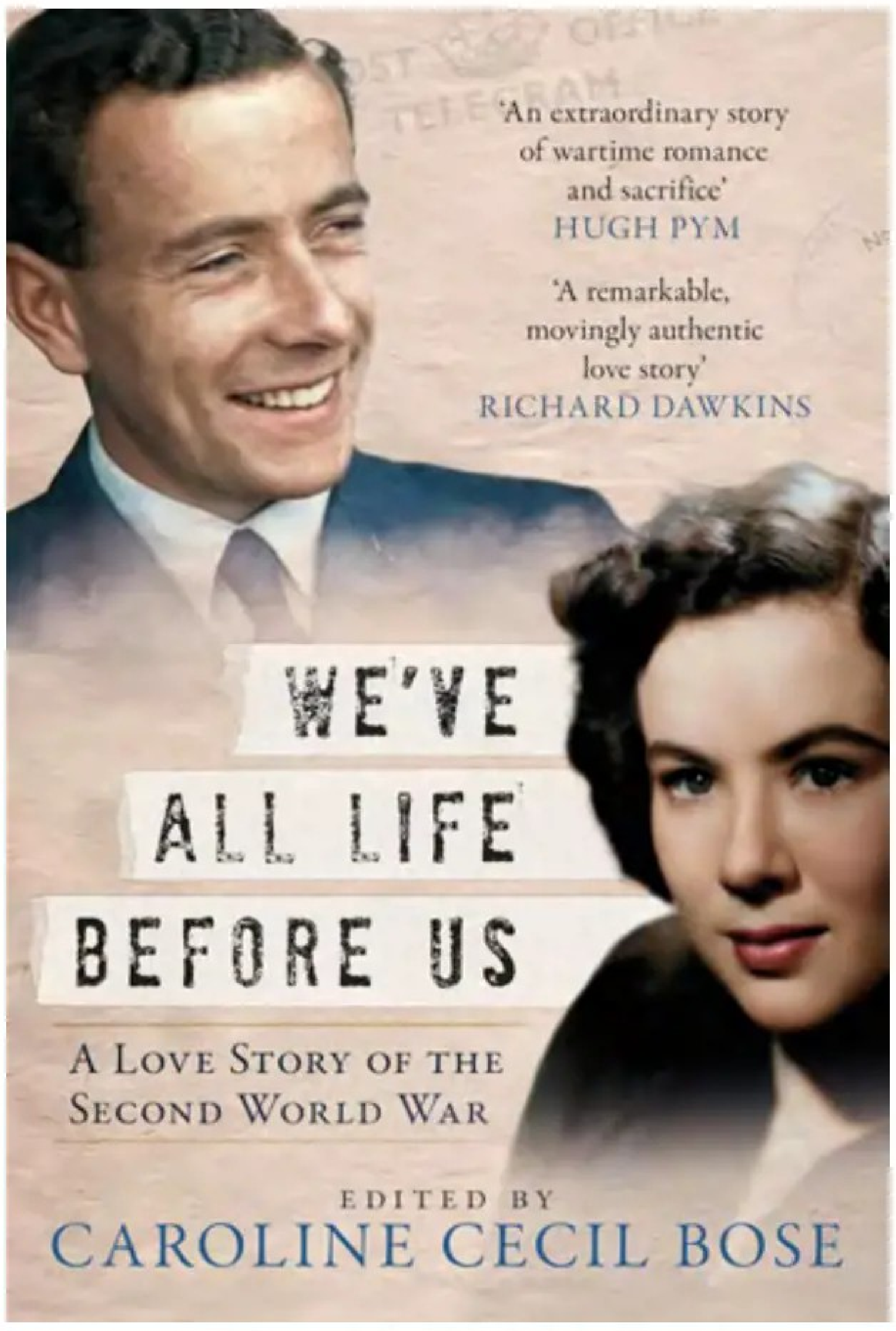
ISBN 978-1-03612-521-9; 9.5 x 6.4in hardback; 300 pages, illustrated; £25.00

★★★★★

We've All Life Before Us

edited by Caroline Cecil Bose
published by Fonthill

This book chronicles the meeting of two people, their subsequent marriage and the husband's death all too soon thereafter while piloting an RAF Catalina. The story is told in the letters of Robert Keddie to Diana Ladner, between March 1940 and May 1942. Her replies have not survived although some diary entries are quoted, and the editor intersperses the letters with details of the wartime situation.


'An extraordinary story of wartime romance and sacrifice'
HUGH PYM
'A remarkable, movingly authentic love story'
RICHARD DAWKINS
WE'VE ALL LIFE BEFORE US
A Love Story of the Second World War
EDITED BY
CAROLINE CECIL BOSE

Robert (Bob), already a private pilot, began RAF training in May 1940 aged 22. His almost daily letters to Diana give an interesting insight into the life of a new recruit. His training continued at St Leonards and Monktonhead in Ayrshire, then near Cape Town with the South African Air Force. Finally, he was posted to No 210 Squadron at Oban and Sullom Voe as a Catalina pilot, his duties frequently involving patrolling to report enemy movements along the Norwegian coast. Sadly, in May 1942 his aircraft did not return and no trace of it or its crew was ever found. Such a brief marriage was not unusual during the war, but Bob's ability to capture in words both the boredom and the excitement of wartime life, and to convey his deep feelings for Diana, make for a compelling read. ***DJC***

ISBN 978-1-78155-960-4; 9.5 x 6.4in hardback; 192 pages, illustrated; £29.99

★★★

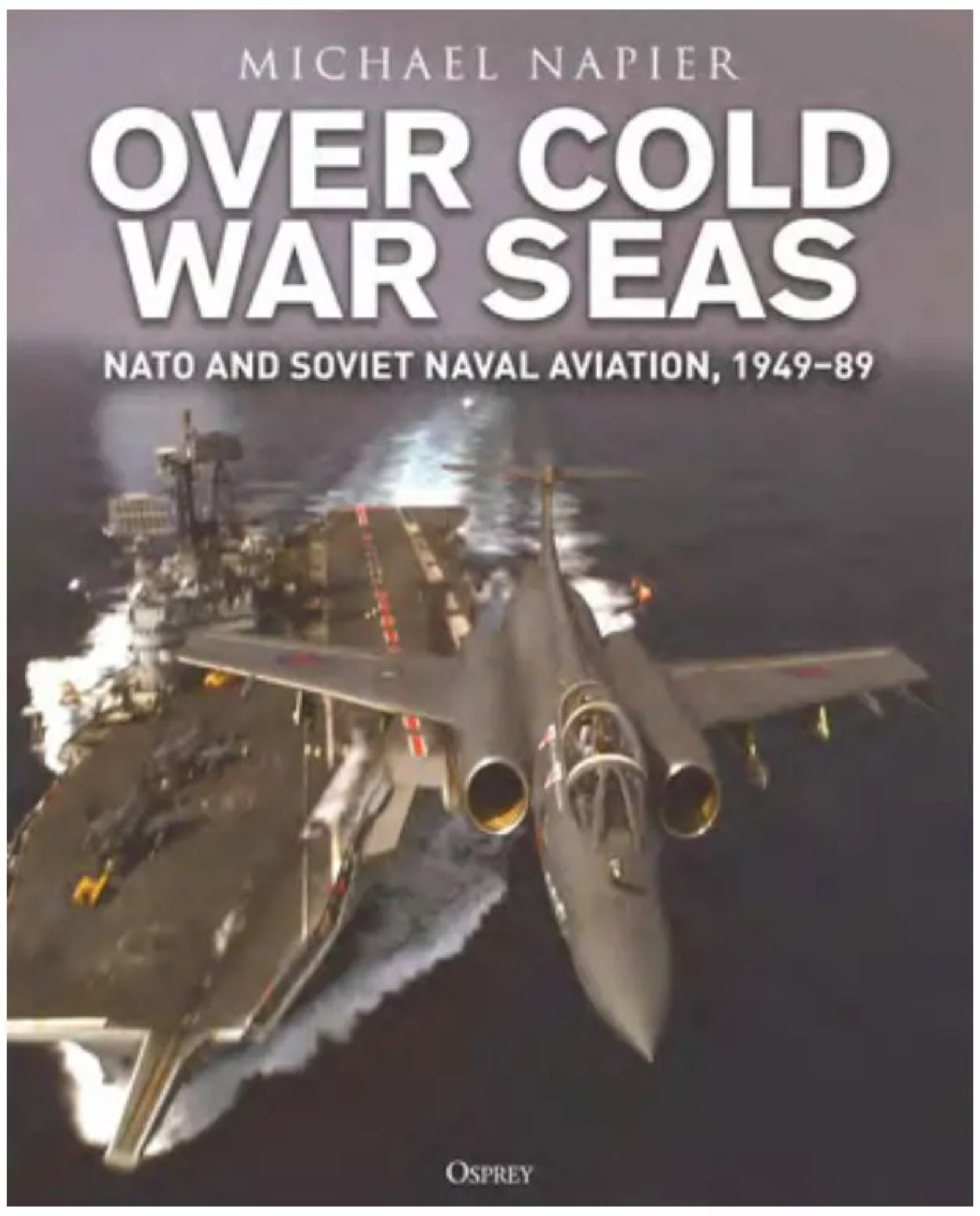
Over Cold War Seas

by Michael Napier

published by Osprey

This represents a good account of naval aviation from the early years of the Cold War through to the fall of the Berlin Wall in 1989. Napier, an ex-RAF Tornado pilot, writes well and interestingly. Cold War naval incidents, some well-known, others (such as the 'Catalina Affair' in the Baltic in June 1952) less so, are well-related. There are also first-hand accounts from front-line participants of the time, presented as boxed items, with contributions from a P-3C pilot, a Norwegian Starfighter pilot and others.

The whole reads well, the text being supported by a rich selection of images, all with good reproduction. The only significant down-side is evidence of poor proof-reading; the Dutch aircraft carrier *Karel Doorman* (correct spelling) also appearing as 'Karel Dooman' and 'Karel Doornan'. This lapse is completely out of character for an Osprey title. ***DJC***



ISBN 978-1-4728-6552-6; 10.0 x 7.8in hardback; 320 pages, illustrated; £30.00

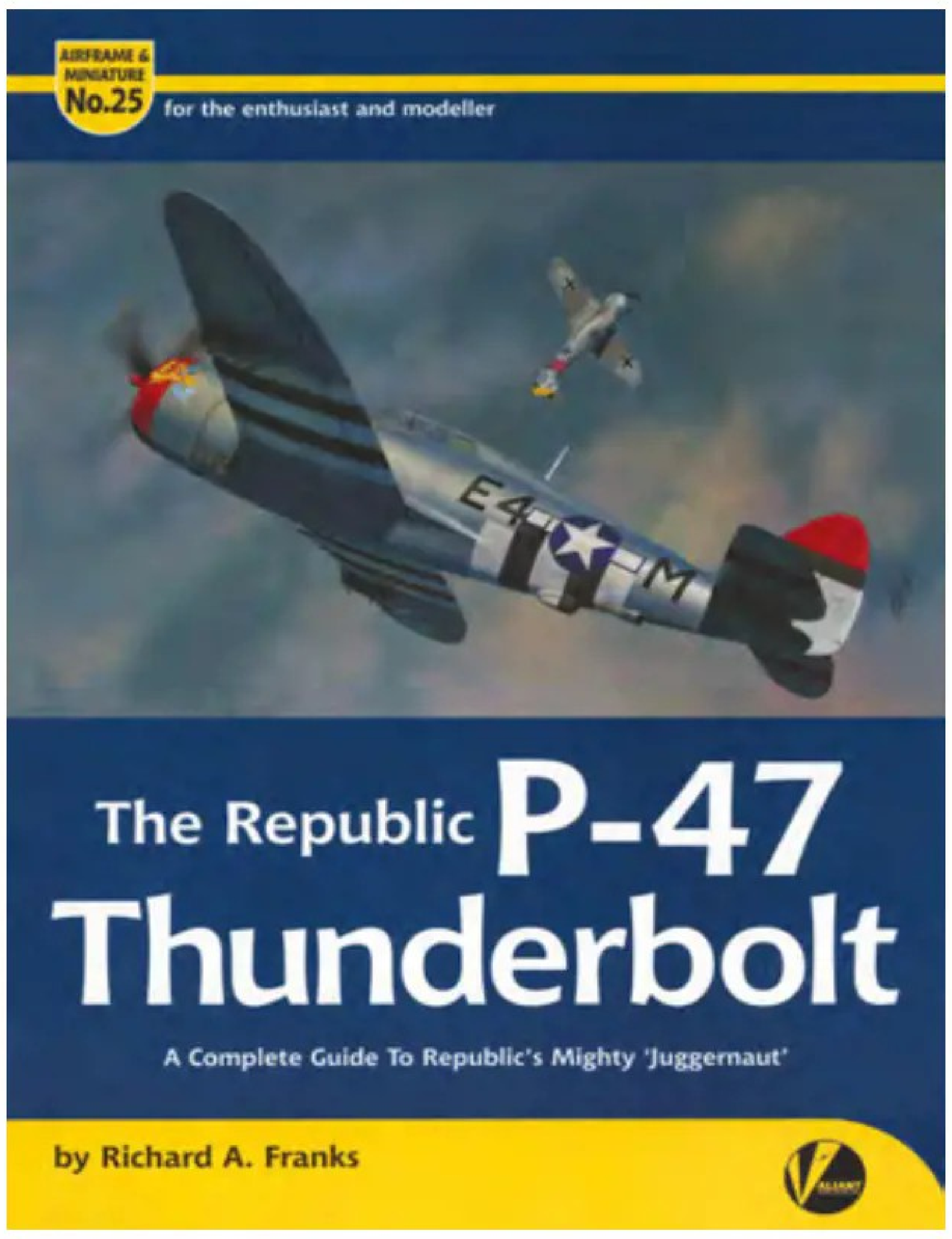
★★★

Airframe & Miniature No 25: The Republic P-47 Thunderbolt

by Richard A. Franks

published by Valiant Wings

The flyer that accompanies this large softback volume notes, "The P-47 Thunderbolt [is] one of the most popular aircraft modelling subjects". It is equally true that Republic's heavyweight World War Two fighter exerts a similar attraction on anyone who's seen a warbird example in flight, exhibiting a surprising degree of agility. As with previous volumes in the Airframe & Miniature series, this one successfully treads a middle course that ensures its appeal to both modellers and historians. All versions of the 'Jug' are covered, from the XP-47B and P-47B (which never entered squadron service), through the major production version, the P-47D (12,602 examples built) and on to the final production P-47N and P-47M.


AIRFRAME & MINIATURE No.25
for the enthusiast and modeller
The Republic P-47 Thunderbolt
A Complete Guide To Republic's Mighty 'Juggernaut'
by Richard A. Franks

The series' trademark section of isometric drawings illustrating the differences between each variant — and each production block — covers more than 40 pages and is as instructive as ever. P-47 kits are accorded their own chapter, with reviews of many and detailed builds of a few, while there are numerous 'walk-around' detail shots and colour profiles. Photo reproduction is very good; how often do you read that? A large set of pull-out plans in 1:48-scale completes an attractive offering. ***DJC***

ISBN 978-1-912932-39-9; 11.7 x 8.2in softback; 288 pages, illustrated; £29.95

★★★

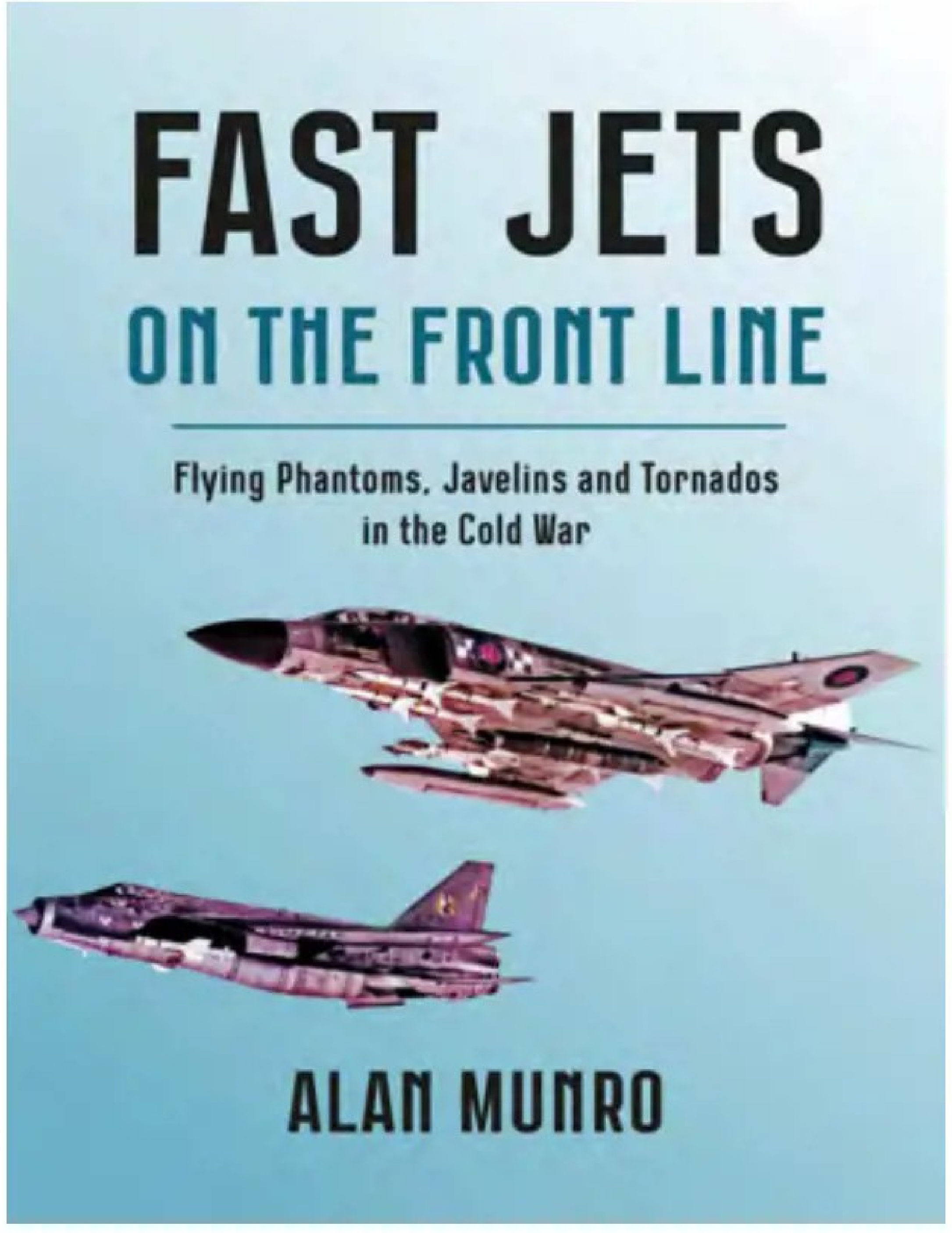
Fast Jets on the Front Line

by Alan Munro

published by Grub Street

There is, presumably, a healthy market for Cold War-era aircrew memoirs, otherwise publishers wouldn't be bringing so many of them out. Alan Munro has an especially broad spread of experience to draw on, concentrating largely on his time with the Phantom force in the UK and with RAF Germany. There's also plenty of material from the periods he spent on the Harrier, as brief as that was, and later the Tornado GR1 with the Tri-National Tornado Training Establishment. But perhaps most interesting is Munro's first tour, as one of the last Javelin pilots with No 60 Squadron in Singapore.

The text reads well and includes many a humorous anecdote. There are, however, some errors an editor ought to have picked up. The Harrier operational conversion unit was No 233 OCU, not 231, while the F-104s pictured on page 128 look like Canadian examples, or maybe Danish — the picture is indistinct — but they surely aren't German, as per the caption. An interesting story concerns the death in jail of a Rote Armee Fraktion (not 'Faktion' as written) terrorist, which led to fears of an airliner being hijacked and crashed into the German parliament in Bonn. Had it happened, RAF Germany Phantoms would, Munro says, have been ordered to shoot it down after consultation between the German chancellor and Prime Minister Margaret Thatcher. This tale unquestionably demands further investigation, but the deaths — multiple — in Stammheim prison occurred *before* Thatcher came to power, as indicated by its position in Munro's narrative. ***BD***



ISBN 978-1-911714-24-8; 9.5 x 6.3in hardback; 192 pages, illustrated; £25.00

★★

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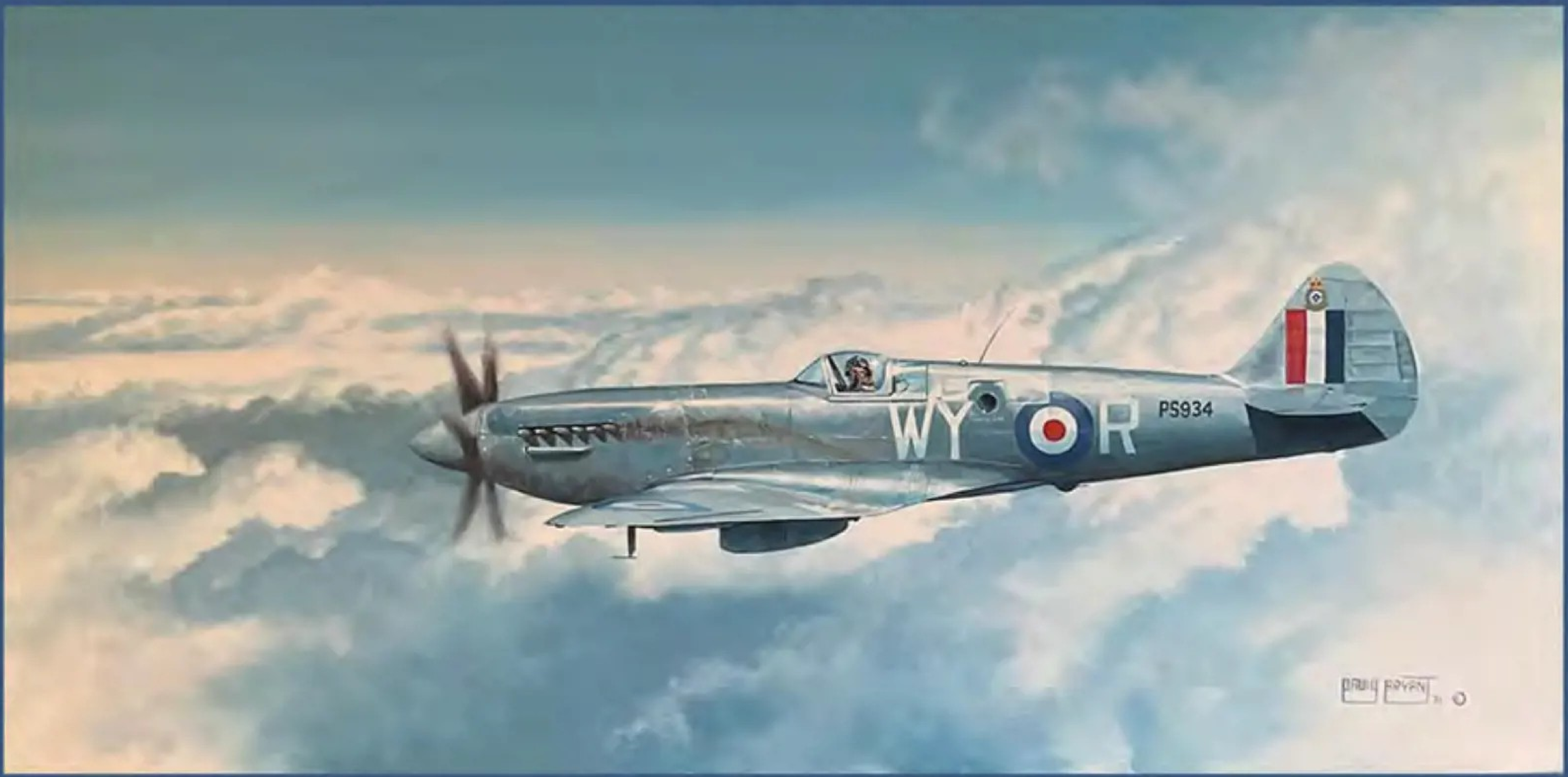

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